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STEEL

The Magazine of Metalworking and Metalproducing

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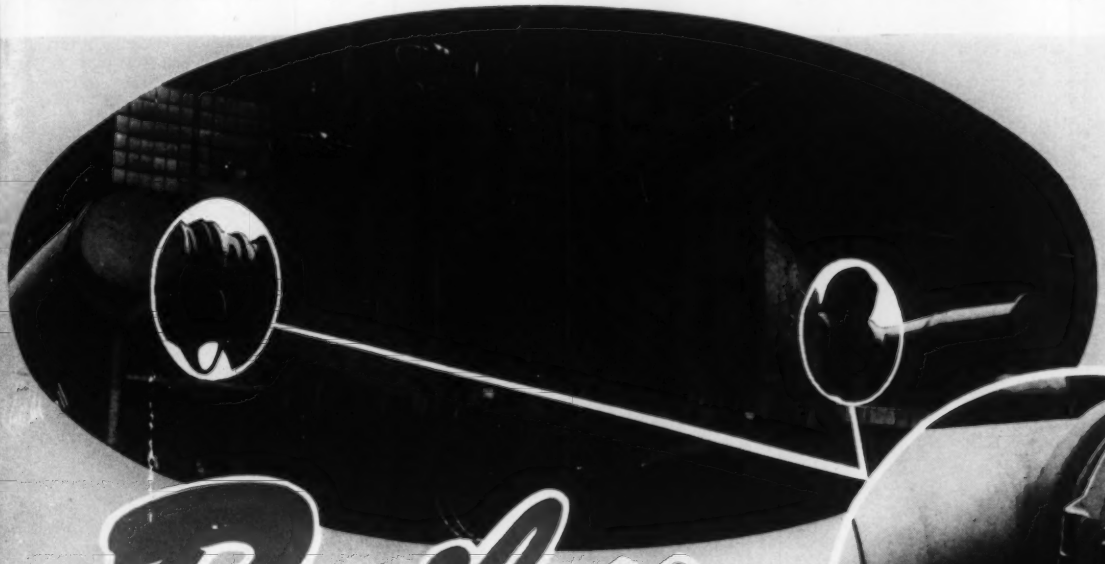

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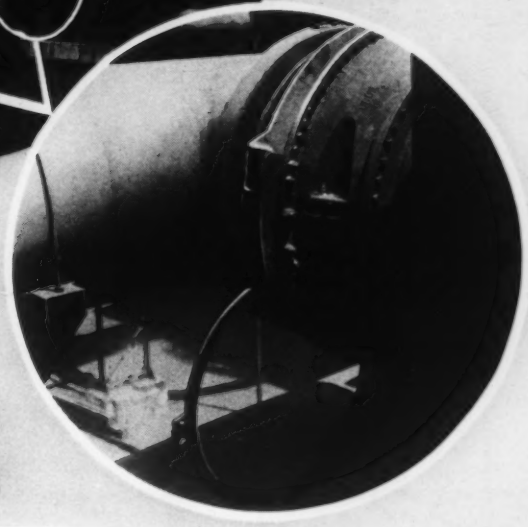

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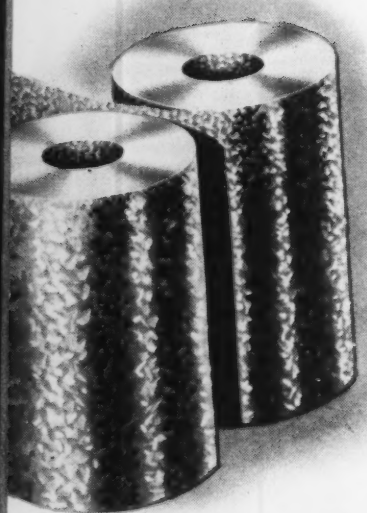

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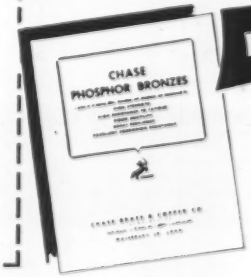

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Behind the Scenes...

Female Sheep in Australia

We were over in the Business Information Division of the Public Library the other day and were amazed to discover what some people want to know. One muscular looking fellow inquired about the existence of gold in the antarctic. A well dressed, gray haired gentleman was interested in the number of female sheep in Australia (the Business Information people told him, too).

STEEL brings packaged business information to your desk every Monday morning. The editors don't give you details about gold in the antarctic or female sheep in Australia, but they do round up practical, valuable facts, figures and analyses on metalworking that you can use.

In a readership study of STEEL's market section, results show that 97.1 per cent of those who answered a questionnaire read the market summary (this week on page 155); 97.9 per cent read the market reports on various steel products (this week beginning on page 166); 89.5 per cent use or refer to the price comparisons (page 156); nearly a third use STEEL's scrap quotations (page 164) on contracts. To those of you who took time out to answer the questionnaire—many thanks!

On Wolves at Doors

Does your mail consist of a disproportionate number of requests for contributions to good causes? Here's how one man, contributing to the lawyer's magazine *Case and Comment*, responded to an appeal for funds:

"Dear Sir: In reply to your request to send a check, I wish to inform you of the status of my bank account which makes it almost impossible.

"This condition is due to federal laws, state laws, county laws, corporation laws, liquor laws, mothers-in-law, brothers-in-law, sisters-in-law and outlaws.

"Through these laws I am compelled to pay a business tax, amusement tax, head tax, school tax, gas tax, light tax, water tax, sales tax, meat tax, carpet tax, income tax, food tax, furniture tax and excise tax. Even my brains are taxed. I am required to get a business license, car license, truck license, meat license, not to mention a dog license and marriage license.

"I can tell you honestly that except for the miracle that happened I could not enclose this check. The wolf that comes to the door just had pups in my kitchen. I sold them to the zoo and here is the money."

Schoolroom Aid

We have always considered STEEL useful for a lot of things, but we had never given much thought to its role as an aid in geography. John W. Alexander, assistant professor of geography at the University of Wisconsin, puts us straight.

"I use the information and statistics which STEEL contains," he says, "to compile accurate maps showing the location of the steel industry in this country. Without these maps, I would have been lost in teaching a course on geography of manufacturing, and obviously the maps would have been impossible without these statistics."

Puzzle Corner

E. L. Sweet of Standard Gage Co. says, correctly, that ten cube-shaped specimens could be identified by the method described in the puzzle of Mar. 20. One cube has no sides ground; one has one side ground; two have two sides ground; two have three; one has one side not ground; two have two sides not ground and one has all sides ground.

F. S. Pirrie of Electric Auto-Lite Ltd. submits this number puzzle: Arrange the numbers from 1 to 25 inclusive in five rows of five numbers wide so that all totals (horizontal, vertical and two diagonals) will add up to 65. For a hint, we'll give these clues as to how a few of the numbers go:

x	x	1	x	x
x	5	x	x	x
4	6	x	x	x
x	x	x	x	3
x	x	x	2	x

Shrdlu

(Editorial Index—page 55)

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STEEL

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Next Week **... Mechanized Handling Boosts Pace of Mass Producing Die Castings ... Creep Testing Cold Drawn Ingot Iron ... Development of Improved Metals To Determine Success of Atomic Energy Program ... Production of Semifinished Steel—I**

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CURBS WEAR

NI-RESIST reduces wear and galling, because graphite particles are distributed throughout its structure, as in gray iron. From this, and its work-hardening characteristics, come the superiority of NI-RESIST castings for components in metal-to-metal wear service.

CHECKS EROSION

This superior wear-resistance . . . together with inherent resistance to corrosion . . . makes NI-RESIST an outstanding material for curbing erosion by liquids and slurries. By long, trouble-free control of erosion, NI-RESIST castings reduce maintenance costs, production tie-ups and the expense of replacements.

WITHSTANDS HEAT

Although primarily used to resist corrosion, erosion and metal-to-metal wear . . . NI-RESIST is also specified for resistance to elevated temperature effects. Castings of NI-RESIST show up to 10 times better scaling resistance, and up to 12 times better growth resistance than those of plain iron at 1300 to 1500°F.

MACHINABILITY and OTHER PROPERTIES

NI-RESIST of normal hardness machines like 200 BHN gray iron and is readily weldable.

NI-RESIST has high specific electrical resistance. Thermal expansion can be controlled, from 60 per cent higher than that of plain iron to a low approximating that of Invar.

NI-RESIST is usually lower in cost than most other corrosion-resistant alloys. It is produced by authorized foundries only, in all industrial centers of the country. NI-RESIST castings have no more limitations in size and complexity than those of any gray iron.

APPLICATIONS

Several types of NI-RESIST *are available. All provide the fundamental properties described above, and differ only in certain special characteristics to meet a variety of industrial demands.*

Applications include: Salt filter drums, oil refinery tube supports and headers, turbine nozzle rings, cylinder liners, valves and fittings, furnace rollers, textile rolls, comminuter parts, blow pit pipes, precision machine tool spindle heads, bridge, and work supports, magnet housings, sugar retorts, etc.

FULL INFORMATION

May we send you two booklets? One, entitled, "Engineering Properties and Applications of NI-RESIST," includes corrosion data on NI-RESIST and cast iron under 400 different corrosive conditions. The other, entitled, "Buyers' Guide for NI-RESIST Castings," lists producers of NI-RESIST castings. Both are yours for the asking. Write for them today.

*Reg. U. S. Pat. Off.

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April 3, 1950

Unfair Attack

Careful examination of the majority report of the Joint Committee on the Economic Report on steel prices shows it to be unbelievably loaded with prejudice, vindictiveness and deliberate misrepresentation.

Therefore it is not surprising that six dissenting members of the committee, in a minority report, felt called upon to cite chapter and verse in a score or more of instances wherein the majority of eight displayed bias, usually by distorting or ignoring pertinent evidence. Nor is it surprising that Senator Ralph E. Flanders, in an individual comment on the majority report, said "I am sorry that the joint committee is putting out reports of this caliber and I find myself astonished that some of my respected associates on the committee have read it so carelessly that they are willing to sign it."

To these charges of unfairness we could well add our resentment that the author of the majority report lifted 13 words out of an article appearing in the Dec. 26, 1949, issue of this publication and in so doing deliberately gave a false impression of the real meaning of our text. (See page 63 in this issue).

After reading the majority report it is apparent what happened. When U. S. Steel raised prices, Senator O'Mahoney burst out in immediate, hot-headed criticism. He was unimpressed by evidence presented at the hearings. Staff members who drafted the report very likely took their cue from the chairman and thus slanted it against the steel companies in shameful fashion. It is quite possible that some members of the committee who signed it were not aware of its bias.

The important point is that this type of malicious mudslinging is harmful to the nation. As recently as last Friday in White Sulphur Springs, Secretary of Commerce Charles Sawyer, paid high tribute to private business. "To contemplate the collapse or even the weakening of this great institution," he declared, "is frightening." But, he warned, "if we magnify our differences and if each group guards jealously its prerogatives and withholds from others its good will and its assistance—America may go down in ruins."

Majority members of the joint committee may well reconsider the implications of their unfair attack lest they unwittingly become the architects of destruction.

* * *

THEME—COST CUTTING: A substantial portion of this issue is devoted to material pertinent to the convention and exhibition to be held in Philadelphia, Apr. 10 to 14, under auspices of the American Society of Tool Engineers. It is the society's seventh show and it will surpass its predecessors in size, attendance, timeliness and importance.

The basic reason for this superiority lies in the present urgent need for greater economy in production. The Philadelphia event has been aptly named the "industrial cost-cutting exposition." One cannot scan the program of events —the economic forum Monday evening, the technical sessions and scope of exhibits at the show —without realizing that the primary objective behind this undertaking is to demonstrate how the latest developments in tool engineering can help manufacturers to reduce unit costs to offset higher wages, taxes and other uncontrollable items.

Featured in the technical sessions are numerous subjects of current timeliness, such as the potentials of cold extrusion, automation (a re-

(OVER)

cently coined word to denote cost-saving movement of materials and parts from one operation to another), improved techniques in machining. and improvements in tooling for specific jobs. The show itself is much more than a mere exhibit of tooling. More than 320 companies will put on display equipment, materials and services which really constitute the ingredients of the American system of manufacturing.

A hundred dollars of expense incurred in going to Philadelphia may easily yield a return of thousands in practical cost-saving ideas.

—pp. 92-153

* * *

BETTER FREIGHT CARS: It is news when a responsible manufacturer indulges in self-criticism publicly. John I. Snyder Jr., chairman and president of Pressed Steel Car Co., says "freight cars today are basically the same as they were when the industry was revolutionized by introduction of steel cars. . . . The car building industry has failed to maintain its original leadership in product design and engineering. . . . If we continue to default our leadership . . . there is no reason for our existence and no reason for our customers to refrain from manufacturing the product themselves."

In answer to this indictment, Pressed Steel Car is testing two new types of freight cars which, compared with conventional rolling stock, will be stronger, lighter, cheaper to maintain, less costly to load and unload, more impervious to weather, easier to clean, more attractive in appearance and cheaper to build, buy or rent.

What Mr. Snyder says about freight cars could be said about some other products. There is abundant opportunity for great improvement in design and construction in many lines. —p. 65

* * *

USEFUL MARKET DATA: Starting last Saturday and continuing through April enumerators will be taking the 17th Decennial Census. They expect to obtain detailed information covering about 151 million individuals, 45 million homes and 6.3 million farms. It is easily the most ambitious census undertaking in the world's history.

To a greater extent than heretofore, the 1950 census will include considerable data on incomes, equipment, facilities and expenditures which will be invaluable in market analyses two years hence when the information has been tabulated and published in usable form. Indicative of the scope of the study is the fact that the agriculture questionnaire contains 334 major questions, with numerous subdivisions. The data sought on dwellings is similarly exhaustive. When the returns are in the metalworking industries will know more about the market possibilities for their products in homes and on farms than ever before.

If you haven't already done so, encourage your employees to co-operate wholeheartedly with the census takers. —p. 68

* * *

INGENUITY PAYS WELL: A. H. Allen's report on "automation," as developed at Ford Motor Co. under the inspiration of Del. S. Harder, vice president-manufacturing, merits careful study by every manufacturer in the metalworking industries. At first glance, hundreds will say "that's O. K. for Ford or any other mass production outfit, but it has no place in my modest plant."

That is true up to a certain point, but many of the cost-saving practices in big plants involve principles that can be adapted to smaller establishments. We recall seeing a crude scrap iron and bamboo "pusher" on a billet heating furnace in Formosa that was a perfect oriental version of the Ford automation idea. It worked and it cut costs in a plant that employed fewer than 100 men, boys and girls.

Don't be awed by mass production techniques. With ingenuity you can adapt some of their ideas profitably to small-lot operations. —p. 102

* * *

TUBE DEMAND SHIFTING: Mention of the marked trend toward dieselization of American railroads usually brings to mind the resultant loss of coal consumption. Frequently overlooked is the fact that growth of diesel motive power has seriously affected markets for other products.

A case in point is boiler tubes. A diesel locomotive uses about 10 per cent as much boiler tubing as a steam unit. Whereas 15 or 20 years ago locomotives took about 20 per cent of the total production of boiler tubes, today they account for less than 4 per cent of the output. Popularity of diesel power in the marine field also is reducing consumption of boiler tubes.

Losses attributed to dieselization are offset partially by higher demand for tubing in public utility generating facilities and oil refining installations. —p. 66

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

O'MAHONEY REPORT ON STEEL PRICES—Follow closely what happens to the majority report on the O'Mahoney steel price hearings. Called "grossly biased and unfair" by steel men and congressional authors of the hearing committee's minority report, it nevertheless must not be taken too lightly (p. 63). It could be a preliminary bout for the major event—free enterprise steel vs. nationalized steel—to come some years hence. Authors of the majority report use below-the-belt tactics when they lift quotes out of context.

BUSINESS PROSPECTS—Count on the metalworking industry to wind up the first half, at least, with a full-tilt operating rate (pp. 80-83). High automobile, appliance and construction activities continue to be the industrial mainstays. Engineering construction awards are being awarded in good volume, even for industrial plants. Purchasing agents say no great damage was done to general business by the coal strike.

PLUMBING GOODS—High level of new construction supports the optimism of plumbing goods manufacturers who predict that the 1950 sales of domestic products may approach the record 1948 levels and certainly will exceed last year's performance (p. 67). Replacement business in plumbing goods is not expected to be high; it rarely is when times are good.

IRON ORE—Another encouraging straw in the wind for future metalworking prospects is the estimate by Great Lakes ore vessel operators that they must carry 75 million gross tons of iron ore in the 1950 season which opens in a few days (p. 65). About 69.5 million tons were moved in 1949. Despite the progress made in developing means to process the low-grade taconite ore, very little of it will be brought down from the northern experimental plants this season.

CENSUS— Don't look for any great surprise to come out of the government's 1950 census that got under way Apr. 1 (p. 68). But the exhaustive breakdowns on population, housing and agriculture should be a gold mine for metalworking market analysts. Final count will probably show: People—151 million; homes—45 million; farms—6.3 million.

NEW FREIGHT CARS— Pressed Steel Car Co. did some soul-searching about its freight car business and decided that it and other builders are behind the times (p. 65). The self analysis spurred the company to develop two new types of freight cars that it believes will help justify the continued existence of the car building industry. Not yet unveiled, the cars are said to be cheaper to build and maintain. . . Equitable Life Assurance Society is trying a plan whereby it will buy freight cars and lease them to railroads (p. 66).

EUROPEAN STEEL—Europe, excluding Russia, may produce too much steel in 1950 (p. 74). Economic Commission for Europe estimates output will be 68.2 million ingot tons in 1950 and admits "demand might not be sufficient to justify such production." European producers may try to sell their excess to foreign and even domestic U. S. markets now served by American producers. Efforts will be particularly strong to get Canadian customers. Canada ended all but export controls over steel Mar. 31. Improvement in steel supplies, including more shipments from Great Britain, permits relaxation of regulations.

HERE AND THERE IN INDUSTRY— Climax Molybdenum Co. of Michigan is stepping up its research activities to find more applications for molybdenum (p. 64) . . . Austin Co., Cleveland, will increase the production capacity of its steel fabricating division 50 per cent, at a cost of $750,000 (p. 68) . . . American universities and colleges are showing an increasing interest in business problems (p. 70) . . . Willys-Overland, unlike other auto makers, finds the sales going rougher; it hopes for improvement with a restyled line (p. 77) . . . Boiler tube makers are losing a market because of the trend toward diesels in railroad locomotives and marine engines (p. 66) . . . Prices on electric motors are scheduled to rise—5 per cent on fractional horsepower and 7½ per cent on integral.

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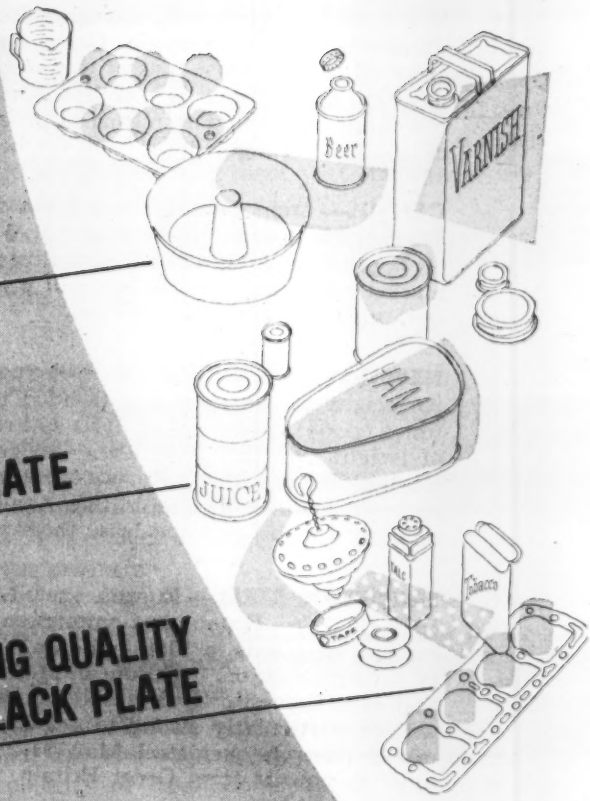

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STEEL
A PENTON PUBLICATION

Signpost for Controlled Economy

Tone of O'Mahoney report disturbs industrial executives. Suggests price fixing, cartelization and possibly nationalization. Attacked for bias and unfairness

WITH MIXED REACTIONS of amazement, anger and alarm industrial executives are appraising the report of the Joint Committee on the Economic Report (O'Mahoney committee).

They are not taking the committee majority recommendations too seriously. They do not believe that the proposals will be acted upon by the Congress. They believe the report is a political trial balloon.

But they are worried over the implications behind the report and by the tone a top congressional committee used in writing it. Steel executives see the report as a trend toward government price control—not only in steel but possibly in other metalworking industries. They see it is a move toward the cartel system or as a possible first step toward nationalization of industry.

Road to Nationalization—Government price fixing in steel would bring an end to competition within that industry," says C. M. White, Republic Steel president. "The government prices automatically would become industry prices without consideration of the cost and marketing problems of the individual companies. Such a revolutionary step would inevitably lead to nationalization."

"The action advocated to require price control is a thinly disguised subterfuge to nationalize a great basic industry," says J. T. Whiting, chairman and president, Alan Wood Steel.

"History will in time generally give the correct answer to most problems. In this case history already has proved that governmental controls of an important internal function of management of a company are unnecessary and unwarranted. A scrutiny of the price policies of many steel companies indicates price increases have been modest and barely sufficient to meet increased costs of labor, freight, coal and other factors affecting the cost of producing steel.

"Compare the increases in steel prices on a percentage basis with the increases of the cost of government, labor, freight, coal and practically every other important commodity in general use. What other commodity can still be bought for 4 to 5 cents per pound? None.

So you want to play, Senator—with OUR chips

"It would be well in order for the Congress to apply their talents to the control of governmental spending rather than the uncalled for interference with the management of business companies."

No Competition?—Steel men believe the committee's charge that competition is lacking in steel is "utterly ridiculous." Competition is keen, they contend, even in the absence of a price war.

Says Carl J. Sharp, Acme Steel president: "A decline in steel demand causing the steel rate to drop to 60-70 per cent would quickly show Congress and the public how competitive the industry is."

"The committee is overly concerned with respect to competition," says W. H. Colvin Jr., Crucible Steel head. He points out that published prices cannot be the sole measure of competition. In the specialty steel industry particularly, quality is more a factor than is price.

Slanted—Industry spokesmen are practically unanimous in the belief that the majority report is slanted and biased and bears little relationship to the evidence presented at the steel price hearings. In this, the minority members of the committee agree.

E. T. Weir, National Steel chairman, describes it this way: "An amazing misrepresentation of facts which could not have been based on the clear and comprehensive testimony of major steel producers."

Deaf Ear—U. S. Steel Corp. points out that the committee ignored its testimony on recent cost increases. U. S. Steel presented evidence that the increased cost of the new pension and insurance plans would be $3.88 a ton, to which should be added 29 cents a ton to cover net increase in cost of purchased goods and serv-

We Said $11.79, Senator O'Mahoney

Here's one example of how the committee majority lifted statements out of context to prop its argument.

It quotes STEEL as authority for the statement: "Increases in the cost of manufacturing automobiles are estimated at $50 to $75 (STEEL, Dec. 26, 1949, p. 19)."

In that article, STEEL's tentative estimates of the additional cost of steel in a typical auto because of base price and extra increases came to $11.79 per car, not $50 to $75. The majority report fashioned its quote from this statement near the end of the article: "B. E. Hutchinson, chairman of Chrysler's finance committee, has said that his people figure a $3 per ton increase in raw steel would mean a $50 to $75 increase in the retail price of the average car by the time all the inflationary factors along the devious supply road are taken into account. And that includes not only steel, but glass, rubber, textiles, etc."

Completely ignored by the majority report was STEEL's analysis of how auto partsmakers' and suppliers' costs are likely to be increased by the same factors responsible for the steel price increase—pensions, insurance benefits, etc.

ices. This gives a total increase in costs of $4.17 per ton of steel, compared with the average increase in steel prices of $3.82 per ton.

The committee ignores the $3.88 figure for social security costs, but picks up the 29-cent figure of materials and services cost and decides that this 29-cent a ton increase is "an amount somewhat small to warrant a major price boost."

Six Against Eight—The six minority members of the committee are as severely critical of the majority report as are industry executives.

"The recommendations of the majority committee look strongly in the direction of government price control. In this respect they are in accord with the controlled economy policies of the administration . . ."

The minority report particularly criticizes the majority for lack of fairness and impartiality. "This is evidenced by the careful selection of quotations from witnesses . . . as well as omissions of references to much pertinent evidence."

Tripartite Role—The "conclusions derived from limited and selected statements and figures reflect the tripartite role of the writers of the report—that of prosecutor, judge and jury. The report does no credit to a committee set up by Congress to study, analyze, review and report on economic matters of broad significance in an impartial, scientific and constructive way, and is an affront to the American sense of fair play."

Socialism Shadow

"I BELIEVE that if the exhibit appearing in STEEL, Mar. 20, p. 54, is offered to industry and used as a stuffer in all mail, it will get the wide distribution that it should have and make the people conscious of the high cost of government which is engulfing us."

So suggests L. H. Hersee, purchasing agent of Union Fork & Hoe Co. He refers to a feature in STEEL that included an excerpt from a speech and a map showing how socialism's shadow is creeping across the country. The speech and map were presented by George E. Stringfellow, vice president and division manager, Thomas A. Edison Inc., at a meeting of the Camden, N. J., Junior Chamber of Commerce. Copies of the talk and map may be obtained by writing Mr. Stringfellow, Thomas A. Edison Inc., Edison Storage Battery Division, West Orange, N. J.

Blueprint for Socialism

A "continuing" investigation of the steel industry to ward off repeated inquiries "plaguing" that industry will be asked in Congress by Rep. W. Kingland Macy (Rep., N. Y.).

Likening the steel price report of joint committee majority as "a blueprint for socialism" and "the groundwork for a nationalized industry," Mr. Macy asks for a bipartisan committee to carry on a continuous study of the industry to avoid sporadic investigations which tend to upset business.

Senator O'Mahoney intends to introduce a bill to implement some of the recommendations of the majority report.

Molybdenum Research

Climax Molybdenum of Michigan begins to build a furnace for experimental ingot output

CONSTRUCTION of a vacuum arc melting furnace for experimental production of ingots of molybdenum and certain molybdenum-base alloys, as large as 9 inches in diameter and weighing 1000 pounds, is under way at Climax Molybdenum Co. of Michigan in Detroit.

The Michigan firm is a research subsidiary of Climax Molybdenum Co. Carl M. Loeb Jr. is vice president in charge of development for the parent company; Alvin J. Herzig is president of the subsidiary.

Commercial Uses—Climax research on the melting process began in 1943. Today, 200-pound ingots, 6 inches in diameter, are produced on which methods of fabrication are being investigated. Climax, in co-operation with industrial plants, is using the product from these experiments to explore potential applications.

Experiments reveal that molybdenum and its alloys possess useful hardness and strength in a temperature range above that filled by the present high-temperature alloys. Molybdenum possesses high thermal conductivity and greater resistance to thermal checking than the alloys now available.

Shortcomings — While commercial forging and rolling has been established as feasible, and machining and grinding present no impractical situations, more experience is needed in all phases of fabrication of molybdenum and its alloys. The welding of molybdenum is as yet a laboratory operation that yields erratic results.

The largest single problem standing in the way of early extensive application of molybdenum in many industries is the requirement of protection from oxidation. That problem is being investigated.

Clockless Time Flies

A CLOCK company that never made a clock celebrates its 100th anniversary Apr. 3. Founded by Israel Holmes as Bristol Brass & Clock Co., it's now Bristol Brass Corp.

The Bristol, Conn., company is one of the largest manufacturers of clock brass in the world, says President Roger E. Gay. It also supplies brass for automobiles, electric appliances, hardware and other products.

Lone Star To Add Facilities

Lone Star Steel Co., Dallas, last week completed a $7 million financing program to add finishing facilities to its eastern Texas pig iron plant at Lone Star. The company plans construction of a cast iron pressure pipe plant on its Daingerfield, Tex., property to cost about $1 million.

Last year the company sought a $74 million loan from Reconstruction Finance Corp., which rejected the application. Later it authorized a $34 million loan for use in completing an integrated steel plant provided the company would invest $22 million in plant expansion. Lone Star hasn't accepted the commitment yet.

Here's How To Cut Costs

American Management Association says that a survey of 1000 manufacturing companies shows these to be the major approaches in American industry to cutting costs and increasing productivity:

Ways to get closer co-ordination of production, engineering and sales.

More effective controls for guiding and co-ordinating production performance and checking results against goals.

An increase in the effectiveness of production supervisors.

Development of maintenance programs that lead to savings.

Devising of work measurement and incentive systems more satisfying to the indirect labor not directly on the production line.

Modernization of plant facilities.

The survey was made to prepare an agenda for an AMA conference of production executives in New York, Apr. 3-4, at Hotel Statler.

Lake Shippers Set Sights for Season

Movement of 75 million gross tons of ore is considered to be a sober estimate. If that much is moved, it will be about 8 million tons below the peacetime record

METALWORKING companies are going to have good business for the next 12 months. Such is the inference that can be drawn from the Lake Superior iron ore trade's estimate of what it must accomplish during the 1950 lakes shipping season that is expected to be substantially underway in a few days.

Movement of 75 million gross tons of iron ore down the lakes this year is considered a sober estimate. Approximately 69.5 million tons moved in 1949, a year affected adversely by a business recession and a steelworkers' strike. Shipment of 75 million tons in 1950 would fall only about 7.9 million tons below the peacetime record of 82.9 million tons set in 1948.

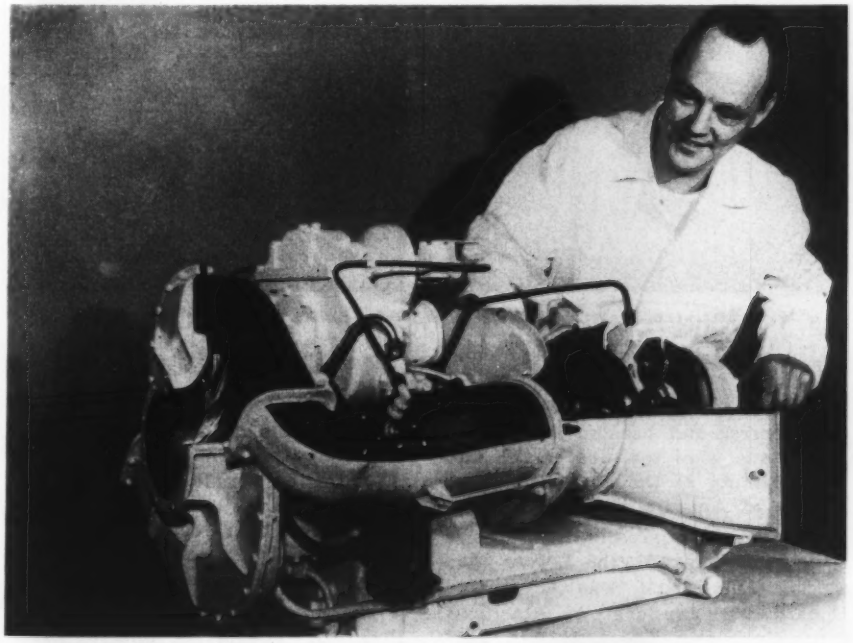
Fewer Boats, but Bigger—Six fewer vessels will be in the lakes ore trade this year than last but the 260 scheduled for operation in 1950 will have a total trip capacity approximately equal to that of the 266 in the trade last year. The new *Wilfred B. Sykes*, built for Inland Steel Co., offsets much of the reduction coming from the cut in the number of vessels. The *Sykes* has a capacity of 20,000 gross tons, biggest on the Great Lakes.

Even though the national steelmaking rate is slightly above 95 per cent of capacity there is not quite the rush now to get the shipping season started as in some years, for stocks at furnaces and at Lake Erie docks in the U. S. are approximately 20 million tons. Last year the Apr. 1 stocks were only 17.3 million tons, and in some years they have been lower than that. Carryover this spring would have been smaller had it not been for the coal miners' strike early this year.

Little Taconite To Move—Although the reserves of high grade Lake Superior ore have shrunk to a level low enough that serious efforts and heavy expenditures of money are being made to develop Lake Superior taconite as a substitute, very little of the latter is expected to be ready for shipment from experimental plants this season.

While the start of the movement of Lake Superior iron ore down the Great Lakes this spring is contingent on softening of ice conditions in the upper lakes area, intralake traffic on both Lake Erie and Lake Michigan is already underway.

Upper Lakes Need Coal—Although there is no great pressure to get iron ore moving to lower lake ports there is considerable interest in the upper lakes area to get coal moving northward to replenish stocks nearly exhausted by the coal miners' strike. As a result of that strike, upper lake docks had only 620,737 tons of coal on hand Mar. 1, compared with a carryover of 3,048,649 tons last year.



LIGHTWEIGHT: Cutaway model of Boeing Airplane Co.'s 200-pound gas turbine is shown at the Boeing Seattle plant. The 160 to 200-hp engine compares in power output to diesel engines weighing 2000 to 3000 pounds. Still in the development stage, the engine has been predicted by Boeing officials to have ultimate application as a power plant for small boats, trucks, earth-moving machinery and for stationary power uses. The model will be on display in Washington, Apr. 12-14, and in New York, Apr. 17-19

New Freight Car Design

Pressed Steel Car Co. will offer rail freight car cheaper to build and maintain

A MAKER of railroad equipment is hauling itself and the rest of the freight car producing industry onto the carpet for not being progressive enough. And under the stimulus of critical self analysis that maker—Pressed Steel Car Co. Inc., Chicago—is doing something to correct the faults it complains about.

Asserting that the railroads should be offered an increasingly better product, Pressed Steel Car announces it is well on the way toward completing and testing two wholly new types of freight cars which it believes will help justify the continued existence of the car building industry.

Better All Around—The new type cars, not yet ready for exhibition to customers, have shown encouraging results in all preliminary tests, John I. Snyder Jr., chairman and president of Pressed Steel Car, reveals.

Compared with conventional cars, the new types, he declares, will: 1. Be stronger; 2. be several tons lighter; 3. have greater cubic capacity while retaining standard clearances; 4. be cheaper to maintain; 5. be operated with less lading damage; 6. be substantially less costly to load and unload; 7. be more impervious to weather; 8. be cleaner and easier to clean; 9. be attractive to look at from the public's point of view; and 10. be cheaper, in production, to buy or rent.

Behind the Times—Observing that "freight cars today are basically the same as they were when the industry was revolutionized by introduction of steel cars," Mr. Snyder laments that "since early in 1948 it has become increasingly apparent that the carbuilding industry had failed to maintain its original leadership in product design and engineering.

"In almost every industry but ours the customer looks to the manufacturer for product improvement. In-

asmuch as railroad men are strong proponents of car standardization as a means of reducing original cost and maintenance expenditures, we, as carbuilders, should have been working toward this end and offering the railroads a better and better product. Instead, we have been content to build the same product as before.

"If we continue to default our leadership in this direction there is no reason for our existence and no reason for our customers to refrain from manufacturing the product themselves," Mr. Snyder observes.

Insurance Firm To Lease Cars

Equitable Life Assurance Society announces a plan for buying new freight cars and leasing them to railroads.

The plan, says T. I. Parkinson, president, will enable U. S. railroads to get as much new equipment as they need without a down payment. That, he points out, would result in speedier freight service and lower operating costs to the carriers because the roads would have more new equipment.

Boiler Tube Firms Lose Market

The drama of dieselization being staged by the nation's railroads is no comedy to makers of boiler tubing. They're losing markets because of it. A diesel locomotive uses only 10 per cent as much boiler tubing as does a steam-drive unit. Another boiler tube market drying up is in marine engines. Shipowners, too, are turning to diesels.

Locomotives now take less than 4 per cent of the total volume of boiler tube production, in contrast to 20 per cent 15 to 20 years ago. Gradual disappearance of that market has been partially offset by expansion of public utilities' steam generating facilities and increased demand for similar pressure tubing in petroleum refining installations. A large proportion of boiler tube demand is for export where steam locomotive building still predominates.

Metal Show Plans Progress

Two hundred of the 350 companies expected to display at the 1950 Metal Congress & Exposition have already signed up for space at the event which is scheduled for Oct. 23-27 at Chicago's International Amphitheater. Show's theme will be: Metalworking industry's need for greater economy in unit production. In addition to the managing sponsorship of the American Society for Metals, the other three sponsors are American Welding Society, American Institute of Mining & Metallurgical Engineers—Metals Branch, and Society for Non-Destructive Testing.

Business Definitely Improving

Business is definitely improving for the material handling industry.

Members of the Material Handling Institute, meeting in Cleveland Mar. 29, were asked by their president, J. H. W. Conklin of Clark Equipment Co. to report on conditions individually. The consensus:

Sales in first quarter about matched or exceeded those for first quarter last year. One maker of overhead cranes reported a 50 per cent increase, another the largest volume since the end of the war.

Most companies report a pickup in inquiries and fatter order backlogs; so second and third quarters are expected to be better than the like periods of 1949 and much better than the first quarter this year. Few would venture a prediction for fourth quarter; some said 1950 would be a better year as a whole than 1949.

To sell more, the industry will feature cost-saving features at a show in Chicago, Apr. 30 to May 4.

Eastern Rail Rate Proposed

Tariff Executives Association of Eastern Railroads proposes a rate of 40 cents minimum on 80,000-pound carlots from Pittsburgh to Baltimore, against the present rate of 52 cents, based on minimum 40,000 pound carlots. Through typographical error these rates were referred to in STEEL, Mar. 20, p. 47, as applying from Pittsburgh to Bethlehem, Pa.

Two Receive Steel Founders' Society Gold Medals

JOHN F. LACEY
. . . Technical & Operating Gold Medal

A. T. McDONALD
. . . Lorenz Memorial Gold Medal

Research, product development, cost control and pension and insurance plans were features of the annual meeting of the Steel Founders' Society of America in Chicago.

Honored with presentation of the society's top award, the Lorenz Memorial Gold Medal, was A. J. McDonald, vice president of American Steel Foundries, Chicago. Mr. McDonald was cited for successful guidance of the group's Product Development Committee. Award of the society's Technical & Operating Gold Medal for 1949 was made to John F. Lacey, works manager, Commercial Steel Casting Co., Marion, O. Mr. Lacey was honored for his co-ordination and leadership of the group's Technical and Operating Committee activities. S. F. Carter, assistant melting superintendent, American Cast Iron Pipe Co., Birmingham, received the annual Steel Foundry Facts prize award, for excellence of published material.

These officers were re-elected: President, Thomas H. Shartle, president, Texas Electric Steel Casting Co., Houston; vice president, John E. Mullen, vice president in charge of sales, National Erie Corp., Erie, Pa.; treasurer, Royal G. Parks, controller, National Malleable & Steel Castings Co., Cleveland.

Plumbing Needs Might Wash Away Blues

Present indications are sales of domestic products may approach 1948 levels. They'll certainly exceed last year's levels. Fixtures, fittings volume may be $300 million

IF THE SPIGOT of new construction is left on at the present rate of flow manufacturers of plumbing fixtures and fittings will quickly get over their discouraging sales experiences of last year.

From present indications their sales of domestic products may approach 1948 levels and certainly will exceed last year's. Metal fixture volume, exclusive of fittings, may amount to $150-160 million. Fittings will amount to about the same.

Down the Drain—Take Crane Co. It has a line of household plumbing and heating fixtures and does a tremendous business in industrial fittings and valves. It underwent a 21 per cent sales decline last year. President J. L. Holloway says two factors were primarily responsible: Drop in industrial construction; inventory liquidation by dealers.

The first of these factors will continue to affect Crane and other companies this year. But the second factor has been pretty well washed away by now. Mr. Holloway contends that some dealers' inventories are too low. Orders in Crane's plants are considerably better than a year ago and their production is "quite a little better," despite the sagging of industrial demand.

Carbon Copy—Much the same situation applies among manufacturers throughout the country. Eljer Co. of California estimates that output, once its strike is settled, may show a 50 per cent gain this year over last. A building boom in the Los Angeles area probably is stimulating business there beyond that elsewhere noted. Kohler Co. and American Radiator & Standard Sanitary Corp. are among the manufacturers that look for a satisfactory year. The latter company's president told stockholders that better demand late in 1949 made increased production possible at all but its cast iron radiator plant at Quincy, Ill.

Several makers of products limited to industrial use are free from anxiety over the probable level of operations for this year. One such is U. S. Pipe & Mfg. Co. which expects production to be maintained close to the 1949 figure. Its order backlog of heavy valves and fittings is about the same as at the beginning of 1949.

Better in Brass—Brass fittings producers predict a demand surpassing that of 1949, largely derived from new construction. Most replacement and repair business for such items has been siphoned off. This business is expected to be under last year's and well below the peaks of 1946-47.

High income, relatively little unemployment are two factors adversely affecting the amount of replacement business available to fixture makers. The replacement market for plumbing items, most producers note, is at its best when overall conditions deteriorate. In some past years replacement business has exceeded new installations. Now it runs 20 per cent or less for many companies. Poor times also bring about changes in distribution. A relatively small part of the makers' sales are to hardware or mail order houses. Complexity of local restrictions plus little encouragement from manufacturers keep low the number of home handymen who install their own fixtures.

Expansion, Contraction—The metal plumbing fixture and fittings industry is comprised of about 270 plants. It underwent an expansion immediately following the war and a contraction as conditions became more competitive. Newcomers were confined principally to valve making; some now find the going difficult.

Keynote—Strong sales effort will keynote the activity of the industry this year. There is greater manufacturing capacity than demand now, and no item except those temporarily affected by the coal strike is in short supply. Competition is severe, and over a wide range of products prices are down about 2 per cent from a year ago. Manufacturers are doing everything possible, manufacturing and design-wise, to hold the price line. But their plans to resist upward revisions began going down the drain when the labor cost stopper was pulled by the pension issue. Labor costs are up 12-15 cents an hour over a year ago at some plants and over the long pull the raw materials price trend appears to be up.

CHATTANOOGA DIVISION OF CRANE CO.

. . . lavatory castings readied for chipping and grinding

Price is not all-important. Tradition is not lightly taken in the industry. The public has resisted some changes which manufacturers contemplated. One was plastic fixtures. Suitable in many applications, consumers nevertheless said "no soap."

Steel or Iron?—Then there is the steel bathtub and shower stall. The long-term trend for these is not yet clear. Probably 90 per cent of the tubs in use are cast iron. New sales run 75-80 per cent cast iron. Entrance of several companies into formed steel bathtub production recently may tip the balance.

The enameled steel tub has several advantages: It is cheaper, some makers say by as much as 40 per cent; it is lighter (200 pounds vs. 400

pounds). Not so good, contend cast iron proponents, are shorter life; design difficulties; finishing problems.

Vitreous on Throne—Vitreous china may also be a long-term contender for cast iron's throne in bathtubs and sinks. Vitreous is already neck-and-neck with cast iron and steel lavatories and accounts for virtually 100 per cent of water closet and flush tank output. Clean design is easier with the earthenware. Finish is said to be superior. But a substantial price differential has not yet been overcome.

Makers of plumbing fixtures and fittings view with uncertainty the export-import situation. Demand is very high abroad, but limitations on American-made products in dollar-short areas effectively plug this possible market.

Latin Plumbing — A few South American countries provide the only major outlet, and the bulk of buying in these is done by American interests for their own people's use. American companies with foreign branches report plant expansion abroad to meet the great demand.

As to foreign imports, the fear is that brass goods may again be offered in formidable quantities, as they were before the war. Japan and China provided most. Japanese interest in the U. S. market is picking up.

Lots of People Spell Big Metalworking Market

"THE STARTING POINT of all markets is people."

That statement of Arno H. Thompson, vice president of J. Walter Thompson Co., tells succinctly just what the 17th Decennial Census means to metalworking.

Lots of Babies—The census will show that the population increase has been the largest between any decennial censuses in the country's history. There are an estimated 19 million more Americans now than there were in 1940 when the population was 131,669,275. The next highest increase was 17 million between 1920 and 1930. Between 1930 and 1940 the increase was only 8,894,229, the lowest for any decade since the 1870s.

The actual census enumeration is scheduled to be completed by the end of April, but it will take until the end of 1952 to complete all the tabulations for reports to be published. Provisional population totals will be announced locally for cities and towns as quickly as the 450 district census offices are able to complete preliminary counts.

Three In One—In reality the census that started last Saturday is three censuses rolled into one: Population, housing, agriculture. The Commerce Department thinks one census can make a great saving in field costs over three separate censuses. Metalworking will find the one census valuable from another angle: All information collected at the same time provides the first exhaustive statistical picture of the nation's people, dwellings and farms in ten years.

Beyond that, the census should give metalworking an encouraging thump on the back: Its engineers, production men, salesmen, advertising men and merchandisers can be assured of the places and products to concentrate their efforts on.

And the Kitchen Sink—Such things as information on kind of heating plant and heating fuel, electric lighting, kitchen sinks and cooking fuel (from the housing census) will be subject to close scrutiny by market experts who can translate the figures into good bets for business. The unprecedented gain in the number of married couples, an upward turn in the average size of young families, a substantial increase in the number of households—facts already ascertained by other surveys—will have a direct bearing on metalworking and metal-producing for the next decade.

Estimates on the final count are: People—151 million; homes—45 million; farms—6.3 million. Whatever the final count is, it spells markets for radios, ranges and refrigerators, autos, air conditioning and airplanes, telephones, television and tin cans.

FARMS
. . . 6.3 million of 'em

Austin to Fabricate More

By spending $750,000 Austin will increase capacity of its fabricating plant 50 per cent

AUSTIN CO., Cleveland, will increase the production capacity of its steel fabricating division 50 per cent at a cost of $750,000.

The expansion includes a fully mechanized shop for production of structural units up to 100 feet in length, says George A. Bryant, president. "While we always have and will continue to look to other fabricators for much of the structural steel used in Austin-designed buildings, the opportunities to render faster and more economical service through mass production of units like standard welded H-section trusses will make the benefits of our research in this field available to a much broader segment of industry."

The project includes installation of about 2000 feet of additional railroad tracks, addition of new 10 and 15-ton electric traveling cranes and a low-head monorail system. The newest type of ac welding equipment will be installed throughout the shop.

New Paint Can Factory

Sherwin-Williams, largest paint manufacturer, will build a paint can factory at Hubbard, O.

The company acquired a 10-acre site and is starting construction at once. The plant is expected to be completed about July 15. Paint cans should be rolling out by Sept. 1.

Cost of the plant is $450,000. Dr. E. E. Ware, executive in charge of erecting the plant, indicates that more money will be spent later.

The plant will use tin plate from Republic Steel Corp.'s tin plate plant at Niles, O., about ten miles away. It will supply cans for Sherwin-Williams plants in Newark, N. J., Detroit and Cleveland and Dayton, O., as well as for some competing paint companies. Sherwin-Williams already has a paint can plant in Chicago. The new plant will be 200 x 250 feet, providing 50,000 sq ft of floor space.

AMF Makes Fast Wrapper

American Machine & Foundry Co., New York, will start producing its new Super-Standard high-speed bread wrapper this summer. Deliveries against orders already booked will commence in the fall.

Capable of wrapping bread at more than 65 loaves a minute, the new machine, the company says, provides increased flexibility of size adjust-

ment, combined with smooth, quiet operation, resulting in a better wrapped loaf at lower cost.

The company this year is observing the fiftieth year of its incorporation.

Stripping Machines Bigger

Increase in strip mining of coal and the encountering of thicker overburden as shallow pits are exhausted are influencing Bucyrus-Erie Co., South Milwaukee, Wis., to produce larger stripping machines.

The company is increasing the boom of its largest dragline from 180 to 200 feet and the bucket from 25 to 30 yards capacity.

Mullins Building Warehouse

Mullins Mfg. Corp., Warren, O., is building a 147,000 sq ft warehouse to cost $700,000. It will be used to store finished Youngstown Kitchens made in an adjoining plant.

The largest construction project undertaken by Mullins since the original plant was built in 1920, the new warehouse will be 264 x 560 feet.

Mullins operates one plant at Warren where Youngstown Kitchen cabinet sinks and base cabinets are manufactured and two plants at Salem, O., where the executive offices are located.

One Salem plant makes kitchen wall cabinets and accessories; a larger Salem plant makes porcelain enameled washing machine tubs, truck cabs and fenders, etc.

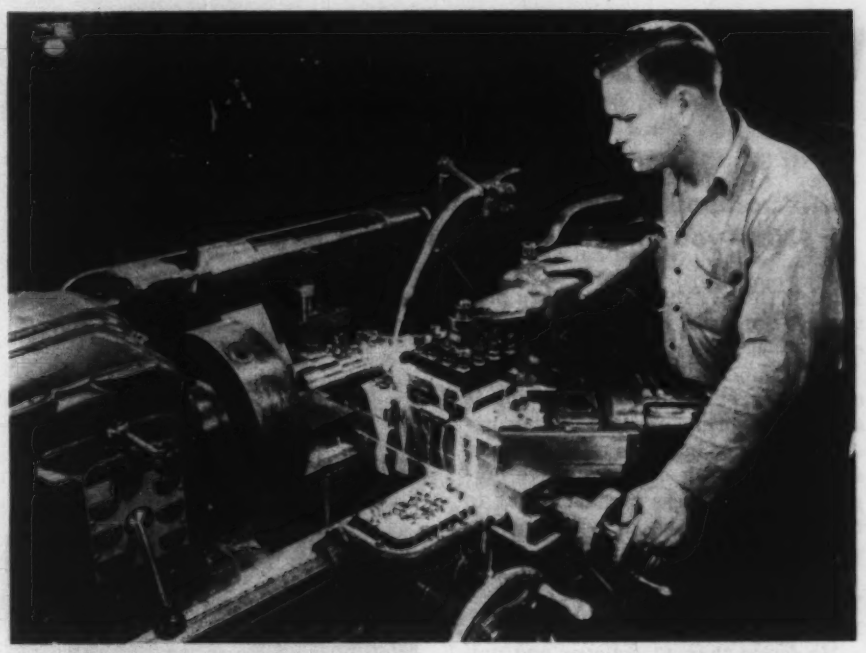
Sangamo To Expand

Immediate construction of additional engineering laboratory space is planned by Sangamo Electric Co., Springfield, Ill. Cost is expected to be approximately $100,000.

The company, whose principal product is watt-hour meters, has a present output more than double its prewar production. Looking to the future, Donald S. Funk, company president, sees a reservoir of meter business stemming from obsolescence. "This reservoir only barely touched over the last ten years should cushion any business decrease resulting from possible slackening of home construction over the next several years."

TV Component Output Up

John Volkert Metal Stampings Inc., Queens Village, N. Y., has produced its 1.5 millionth set of metal parts for electron guns used in television tubes. Volkert has made over 35 per cent of the total number of such components used in all television receiving sets.



ESCAPE VALVE: That's what your tool room and production shop can be for cost cutting. Some surprising economies over former methods have come to users of hydraulic duplicating attachments that work from a model or template by means of a hydraulically controlled cutting tool and a compound attachment. One such duplicating attachment for standard machine tools is this Turchan follower, made by Turchan Follower Machine Co., Detroit. It is attached to a lathe manufactured by American Tool Works Co., Cincinnati. Here is a stepped shaft duplicating job with master mounted between centers supported from the rear of the lathe bed. This method is over three times faster than the old way

The production rate of parts for the guns has jumped from 20 sets per week in 1946, when volume production began, to 30,000 now. The company will boost output to 50,000 weekly soon. Volkert is a pioneer in television tooling. It started contract work for the then-infant industry in 1936.

Volkert today produces 95 per cent of the metal parts for each gun, called the heart of the television cathode-ray tube. Company engineers have redesigned both grids, the anode and the spider or flange spacer for more efficient and economical production.

More Metal Furniture Used

A sharp increase in the use of metal office furniture is apparent. J. L. Mann, president, Sturgis Posture Chair Co., Sturgis, Mich., told members of the National Office Furniture Association at their fourth annual convention and exposition in New York, that an extensive private survey of trends reveals that in the 1920s metal furniture accounted for only 5 per cent of total office furniture sales. In the 1930s it moved up to 25 per cent, reaching approximately 45 per cent just before the war. In 1949 "by all reports," metal furniture accounted for 75 per cent of the industry's total sales.

Sharon Tube To Move

Sharon Tube Co., Sharon, Pa., will move its business to Louisville, O. next fall, Sharon officials say. The company will operate a continuous weld pipe mill for production of ⅛ to ¾-inch pipe in standard and extra heavy weights in black or galvanized finish.

Cold-Rolled Sheets Gain

Shipments of steel products at 5,482,691 net tons in January were the largest for any month since April, 1949. This quantity compared with 5,410,902 tons in December and 5,761,959 tons in January, 1949.

The continued rise to new high tonnages in cold-rolled sheets featured this month's shipments, says the American Iron & Steel Institute. Although total shipments were off slightly from the high levels prevailing in the first four months of last year, January shipments of cold-rolled sheets were larger than ever before at 711,813 tons or 13 per cent of total steel sent out. Shipments of galvanized sheets and pipe also continued large.

The January total of shipments included 32,198 tons of stainless steel and 342,785 tons of other alloys.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

If you've felt resentment against college professors and their "crackpot" attitudes toward business—particularly in the 30s—you may as well forgive and forget

THE STEREOTYPE of a college professor—complete with umbrella and rubbers—is undergoing a change.

The symbolic "crack pot" is gradually being replaced by a man who is striving to bring about a better understanding of business and its needs, an understanding of the positive programs that business can undertake to fulfill its functions in a prosperous economy.

In harmony with that picture of "The American College Professor—1950" is this background:

No fewer than 41 colleges and universities now are offering courses in business. The total is increasing each month.

Research projects for solving one or another of the problems of business are increasing rapidly. Right now 1188 such projects are being carried on at 105 educational institutions.

Business Clinics—No fewer than 26 colleges and universities are conducting "clinics" for analyzing business problems and developing management's approach to them. Active participants are representative businessmen from the general area in which the college is located.

Three state universities—Michigan, Indiana and Texas—are pioneers in establishing services under which businessmen come in, in groups or as individuals, with specific questions to be answered in the light of the combined resources of the university. Several other institutions have similar activities in the planning stage.

To a considerable degree this movement is an outgrowth of several years of effort on the part of the Commerce Department's Small Business Division. But Commerce officials prefer to give credit to wide-awake educators who realize that the country needs a more penetrating understanding of conditions that will encourage business, promote employment and raise living standards.

"The colleges and universities are definitely interested in this work, and we sense a real groundswell of initiative," says Dr. Wilford White, head of the Small Business Division's University Extension Service. "What we are doing here in Washington is intended to encourage the development and assist it along effective lines."

DR. WILFORD WHITE
. . . senses a groundswell of initiative

Use of the term "small business" does not reflect any significant restrictive tendency. The Commerce Department looks at small businesses this way: They are the cross-section of more than 90 per cent of business firms in the country. Small business includes all but a relatively few companies that by reason of dominance in their fields are "big business"—well able to look after their interests without outside assistance.

Well Fed—Dr. White's unit advises colleges on the curricula for business courses. He feeds them material for use in their business clinics. He suggests good subjects for effective business research and management projects. He sends to the interested colleges and universities a large amount of helpful literature and encourages them to reprint it for wide distribution.

An example of the other types of assistance furnished is the Finance & Tax Section of the Small Business Division under Dr. James C. Dockeray. It conducts a continuing study of the problems incidental to financing new business ventures. Data compiled by this section is especially helpful in revealing to college and university officials and faculty members the type of tax legislation needed to enable business concerns to keep more of their earnings for capital purposes. The title of a new report prepared by Dr. Dockeray for release to the colleges and universities is "A Sound Depreciation Policy for Small Business."

Pay Their Way—Commerce is conducting this program from its regular operating appropriation. While the colleges and universities get a lot of helpful advice and information, they pay their own way.

"The future of this movement," says Dr. White, once professor of marketing at the University of Texas, "will depend a lot on the interest and co-operation shown by businessmen. If college officials get tangible proof that this type of educational effort is a good thing for the country, they can be relied on to expand it and do a good job. Businessmen should discuss their problems with the college men, they should attend the business clinics, they should furnish employment to graduates of the business courses.

"If properly encouraged, the college and university authorities will be powerful friends and allies of businessmen in the fight to maintain and perfect our private enterprise system and to defend it against the encroachments of socialism."

What You Should Know

The things a small business man should know before bidding on government invitations are covered in still another guidebook on how to sell to the federal government.

Compiled by the Chamber of Commerce of the United States, Washington, a 64-page pamphlet lists available government publications on procurement. It tells who does federal purchasing, where to go for information and how government buys.

What Can You Supply?

The importance of government procurement is continually growing. Latest estimate is that federal purchases of products and services of business and industry come to at least $9 billion annually. The armed services buy $8 billion, the General Service Administration $1 billion.

The GSA lists contain many diverse items on which bids are to be opened in April. Here are a few: 597 light trucks, 33 power-wagon-type trucks, 6 ambulances, 29 station wagon automobiles, 15 electric and gas refrigerators, 703 kegs of wire nails, 38 trucks and trailers, 9100 pairs of office shears, 1170 carbon tetrachloride fire

extinguishers, large quantities of paper fastening staples and thumb tacks, 72 aluminum chairs, a great many heavy-duty electric storage batteries, air compressors, tractors, resistance thermometers, fencing, spectrophotometers.

Equally diversified are the purchases of the armed services.

You can get the GSA lists from F. G. Moyer, Federal Supply Service Inquiry Office, Room 7282, Seventh and D Sts., Washington 25.

Shopmen's Library

Small manufacturers will be interested in a "shopmen's library" of 54 technical bulletins shortly to be made available at nominal prices by the Office of Technical Services, Commerce Department.

The bulletins tell how to perform many operations: Hard-facing, extracting broken drills and reamers, metal spinning, machining of plastics, etc. Titles and prices are listed in an "Industrial Notes Circular" that you can get by writing to OTS, Commerce Department, Washington 25.

Government Appointments

Chauncey Y. Dodds was appointed manager, Division of Loans, Reconstruction Finance Corp. Succeeding him as chief of the Small Business Division is Walter J. O'Donnell.

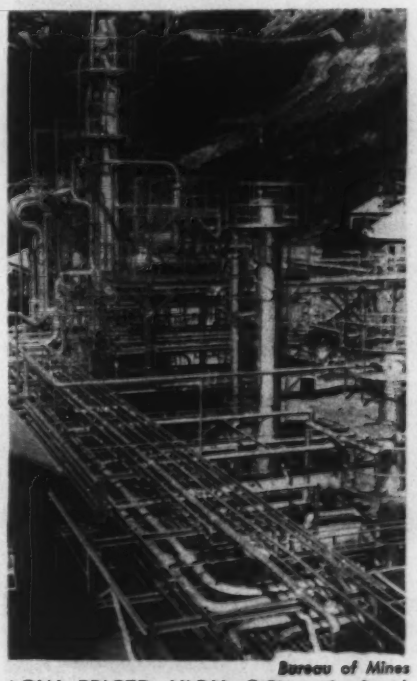
Howard Coonley, formerly president and chairman, Walworth Co., New York, joined the National Security Resources Board as consultant on problems of conservation, substitution and standardization as they relate to mobilization planning. He served as director of the War Production Board's Conservation Division from 1942 to 1944.

Brig. Gen. Joseph A. Cranston, U. S. Army (ret.), joined the administrative staff of the National Security Industrial Association and will be in charge of co-ordinating the association's activities in the interests of the Army and the Air Force.

A three-man board of contract appeals has been established by the General Services Administration to handle appeals from contractors dissatisfied with rulings by procurement officers. Members will be appointed by Jess Larson, GSA administrator, from time to time as appeals arise; no officer who has participated in the award or administration of a contract in dispute will be appointed.

Industrialists selected by the Interior Department to serve as panel chairman and co-chairmen at the Air Pollution conference to be held in Washington May 3-5 include Dr. Robert A. Kehoe, Kettering Laboratories, Cincinnati; Arnold Beckman, National Technical Laboratories, South Pasadena, Calif.; M. D. Thomas, American Smelting & Refining Co., Salt Lake City, Utah; and William P. Yant, Mine Safety Appliance Co., Pittsburgh.

S. Howard Evans, formerly president, Evans Machinery & Equipment Co., Philadelphia, has been appointed chief, Redevelopment and Relocation Branch, Division of Slum Clearance and Urban Redevelopment, Housing and Home Finance Agency, Washington. His assignments include responsibility for insuring maximum participation by private enterprise in carrying out local redevelopment activities.



Bureau of Mines

LOW PRICED HIGH OCTANE: Steel requirements for producing liquid fuel from shale oil range between 5½ and 6½ tons per barrel of daily capacity—as suggested by this view of the Bureau of Mines demonstration plant near Rifle, Colo. High octane gasoline can be produced from shale oil at 7.3 cents per gallon, the bureau says. The time is coming when this new industry will become an important outlet for steel

Middle-Income Housing Issue

Democratic leaders in Congress say the last has not been heard on middle-income housing. Floor Leader John W. McCormack (Dem., Mass.) says it will be a campaign issue this year.

House and Senate elimination of the "co-operative" section of the so-called middle-income housing bill is the worst defeat of the Truman administration since Congress last year refused to repeal the Taft-Hartley Act.

It also marks a major defeat for organized labor which brought heavy pressure to bear to get federal aid for co-operative housing projects. The successful revolt in the House, which voted after the Senate had acted, was led by Rep. Jesse P. Wolcott (Rep., Mich.). He argued that the co-operative program was "socialistic and a threat to free enterprise." The President had demanded the provision on the ground that it would help $2800-$4400-a-year families who do not want government subsidies "but who cannot pay the rental or sales prices now being asked."

As finally sent to the White House, the bill consisted mainly of provisions for giving more government financial assistance to the private housing industry, providing more funds for mortgage insurance and more funds for the purchase of housing mortgages.

Mobilization Planning Given Ear

Two subcommittees of the Foundry Industry Advisory Committee were called to Washington to discuss mobilization planning with the Munitions Board.

At a meeting in the Pentagon Mar. 15, the foundry industry advisory subcommittee on foundry equipment and the subcommittee on foundry supplies was acquainted with a mobilization plan for the industry prepared by Lee C. Wilson, Reading, Pa., for the National Security Resources Board. Subcommittee members were asked to comment on gaps in the industry's capacity. T. Kaveny Jr., president of Herman Pneumatic Machine Co., Pittsburgh, is chairman of the foundry equipment subcommittee. F. R. Fleig, president of Smith Facing & Supply Co., Cleveland, is chairman of the foundry supplies subcommittee.

The Munitions Board will give further study to the industry's problems to determine whether any government program is necessary to prepare the foundry industry for mobilization. Consideration will be given to a suggestion under which "phantom orders" might be placed for key foundry equipment. Such orders were placed with the machine tool industry last year. It was the first industry to be called in for consultation on mobilization plans.

Joint plans are under preparation by the Munitions Board and the National Security Resources Board to hold mobilization planning sessions with several other basic industries in the near future.

Too Much Steel This Year in Europe?

Economic Commission for Europe estimates output will be 68.2 million ingot tons in 1950. It says: "Demand might not be sufficient to justify such production"

EUROPE, excluding Russia, will produce 68.2 million net tons of ingot steel in 1950, the Economic Commission for Europe estimates. That's 12.5 per cent more than the 60.6 million tons produced in 1949. ECE admits that "the actual demand for European steel might not be sufficient to justify such a level of production."

Then what will be done with the extra steel? That question has been bothering ECA, ECE and other European groups. The only answer is: Create new demand from domestic and export sources.

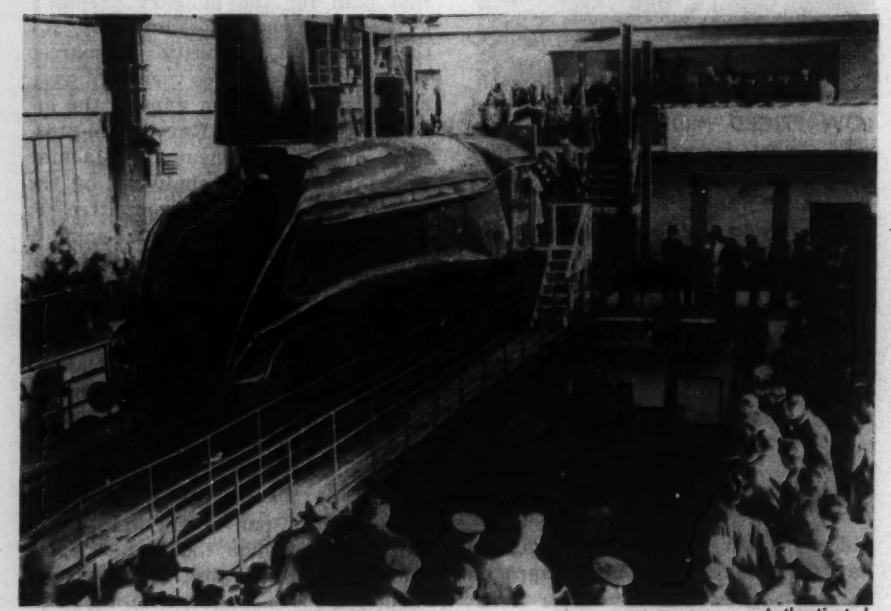
Water in a Sponge—Even a sponge can hold just so much water. Domestic markets have about reached the saturation point in steel consumption—as they now stand. But ECA is trying to get the sponge to hold more water through economic union. Despite the advantages of union, as seen in the history of the U.S., few Europeans really want it. Political leaders and businessmen in Belgium, Luxemburg and Western Germany have publicly supported union, but the attitude of most influential Europeans is: "Yes, but . . . ."

Faltering step toward economic unity is the proposed ERP payments plan that would be a start toward currency convertibility. Britain objects to this.

Saturation Abroad — Export markets, too, have about reached the saturation point in steel consumption. Some underdeveloped areas of Asia and Africa will need more eventually, but their requirements are expanding slowly. Increased sales in those regions won't help much in 1950.

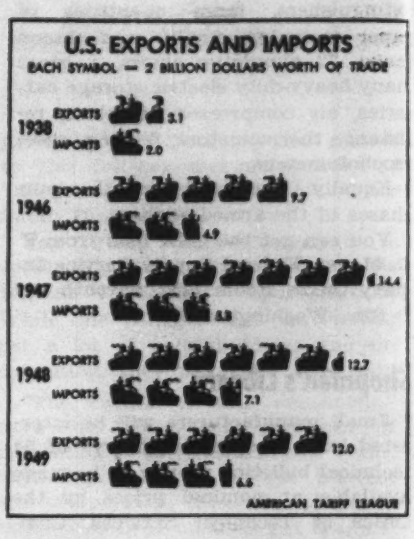
What's left then? Established markets like Canada, South America, the Near East and southern Asia where domestic steel output is still below demand. Look for increased efforts by Europeans to capture more of these markets from American producers. The U.S., which last year exported about 5 million tons of steel and iron products to these regions, may find it hard to match that figure in 1950.

You can even expect increased efforts by Europeans to sell iron and steel products in the U. S. itself this year. American consumers bought 455,000 net tons of foreign-made steel in 1949, most of it from Europe; 477,000 tons were purchased in 1948, 154,000 tons in 1947.



Authenticated

TEST RUN: Orthodox testing of locomotives in England—hauling of test trains, drawbar pulling and a dynamometer car between engine and its train—can now be supplanted by this indoor locomotive testing station. It consists of seven pairs of rollers that support the locomotive and up to five of which are driven by the coupled wheels of the engine. Each of the five pairs is coupled to a "Froude" hydraulic brake or dynamometer capable of absorbing up to 1200 hp and designed for a maximum speed equivalent to 130 mph



U. K. Still Has Steel Shortage

The only country in Western Europe that still has an acute steel shortage is Great Britain.

Despite steel ingot output at the annual rate of 18,926,000 tons in February, her imports of semifinished steel are climbing; 23,520 tons were brought in from abroad in January, compared with 9520 in January, 1949. Iron and steel exports are holding up well; 260,000 tons went overseas in January, compared with 214,000 in January, 1949. Australia is the best customer, followed by New Zealand.

Largest domestic steel consumer is the auto industry which still can't get enough sheets. Shipbuilding activity is still good, but it has slipped from the postwar peak because of increasing foreign competition. The industry remains one of the major ferrous consumers. British railroads are buying steel heavily in a car and track replacement program. Rolling stock manufacturers have a good volume of contracts with overseas railroads. They're assured of work for months ahead.

A pending rail freight increase has British metalworking executives worried about rising costs.

The Labor government, with its narrow margin in Parliament, has been very quiet in the past few weeks. Industry welcomes the calm. On the debit side, though, is the near-suspended status of the government housing program. Labor wants no showdown on this controversial issue and is moving slowly. Result: Housing construction is declining, to the detriment of the metalworking industry.

French Production High

France seems to be as resilient as a rubber ball. Despite labor troubles, Communist-inspired disturbances and

other turmoil, the French industrial production is excellent.

January output figures show that production is 30 per cent higher than in 1938, 12 per cent higher than for January, 1949, and even greater than the average for the record 1929. Coal extraction in January reached 2497 pounds per man-shift at the coal face, a postwar record that corresponds to 93 per cent of the average yield in 1938. In the Saar district, coal output also reached a record. France has negotiated an agreement with the Saar to mine the area's coal for 50 years. A French public corporation will run the mines and will pay an annual rent of about $1,860,000.

Production of 29,994 cars by French automobile plants in January beat all previous records. Small vehicles formed the bulk of the output. Most of this output is for export, so domestic buyers must wait as long as 20 months for delivery of a Peugeot or Citroen. French Fords can be purchased by domestic buyers more easily.

Because heavy rains and snow have fallen since November, France has cancelled all power restrictions placed in October and November.

That's the good side of the coin. The other reveals a mounting trade deficit and a labor turmoil caused by more deep-rooted reasons than Communist shenanigans. The trade balance deficit amounted to 13 billion francs in January; it was 5 billion the previous month.

The collective bargaining law passed Feb. 11 has opened the way to direct agreements between employers and workers. The wave of strikes sweeping over France is not surprising since nearly everyone agreed that workers' living standards are too low. The trouble is that no pattern for settlement is formed that would enable most disputes to be negotiated without a strike. The result of this individualism is that the French economy is subjected to continuing pin pricks. The government is trying to hold wage increases to 4 or 5 per cent, but labor wants a 10 or 12 per cent hike.

Ruhr Steel Ceiling May Be Raised

The western allies may raise Western Germany's steel production ceiling to about 16 million tons annually.

A sympton of increasing steel competition in Europe is the move by Belgian, French and Saar producers to challenge Ruhr steelmen for the southern German markets. Belgians are undercutting Ruhr prices on some bar products by about $2.50 a ton. The Germans have the price advantage on sheets, structurals and sheet piling.

The new version of Law No. 75, regulating the regrouping of the German coal and steel industries, has been withheld once more because one of the powers—presumably France—wants more changes. A new plan was to have been issued in March.

Steel production still is high. Public works programs, including one for the railways, are now starting. Unemployment is declining; it's still serious, but chances are good that it can be kept under control. Monthly output of automobiles has reached about 20,000, or an annual rate of 240,000, as against 170,000 last year. Some large price cuts are expected soon, because the inland markets are not so eager to absorb new cars as long as prices are so high.

NEA

SPRING FAIR: In Frankfurt, Germany, products of more than a thousand exhibitors are being displayed at the spring fair. Technical products constitute a majority of the displays, the greater part of which are housed in the large main exhibition hall that was restored from bombed rubble

More Austrian Stainless Steel

Austria may be the leading producer of stainless and highspeed steel in Europe by 1952. She is now producing these specialties at the rate of 264,000 tons a year. About 50 per cent of this is exported. Major producers—Alpine Montan, Boehler & Co. and Schoeller Bloeckmann Werke—have all expanded their capacities.

Cars Shown in Switzerland

An International auto show displaying the products of 385 manufacturers from 12 different countries opened in March at Geneva. On display are 72 makes of cars, 48 models of trucks and busses and 102 types of motorcycles and cycles.

British manufacturers are the biggest exhibitors, followed by the U.S., France, Germany, Italy, Czechoslovakia and Sweden. One popular model is France's 4-horsepower Renault selling for $1150. The German Kloeckner-Humbolt-Deutz firm offers a line of trucks and busses powered by air-cooled diesel engines.

Canada Relaxes Steel Control

Canada ended all but export controls over steel Mar. 31. Primary steel still can be exported from the dominion only under permit from the Trade Department.

C. D. Howe, trade minister, says the improvement in steel supplies permits the relaxation of controls.

New order placing is holding at a good level in the Canadian steel markets. Books are filled on most products for the second quarter. Imports from the U. S. have declined, but increased shipments are coming from Great Britain which is edging more and more into the dominion market.

Canadian steel mills are operating close to capacity.

Canadian Plant Sold

The Toronto, Ont., plant and property of Gurney Foundry Co. has been sold to a new firm, Gurney Dominion Furnaces Ltd.

The new company is a wholly owned subsidiary of Standard Sanitary & Dominion Radiator Ltd. which is a wholly owned subsidiary of American Radiator & Standard Sanitary Corp. George C. Crawford, president of Standard Dominion, will become president of Gurney Dominion.

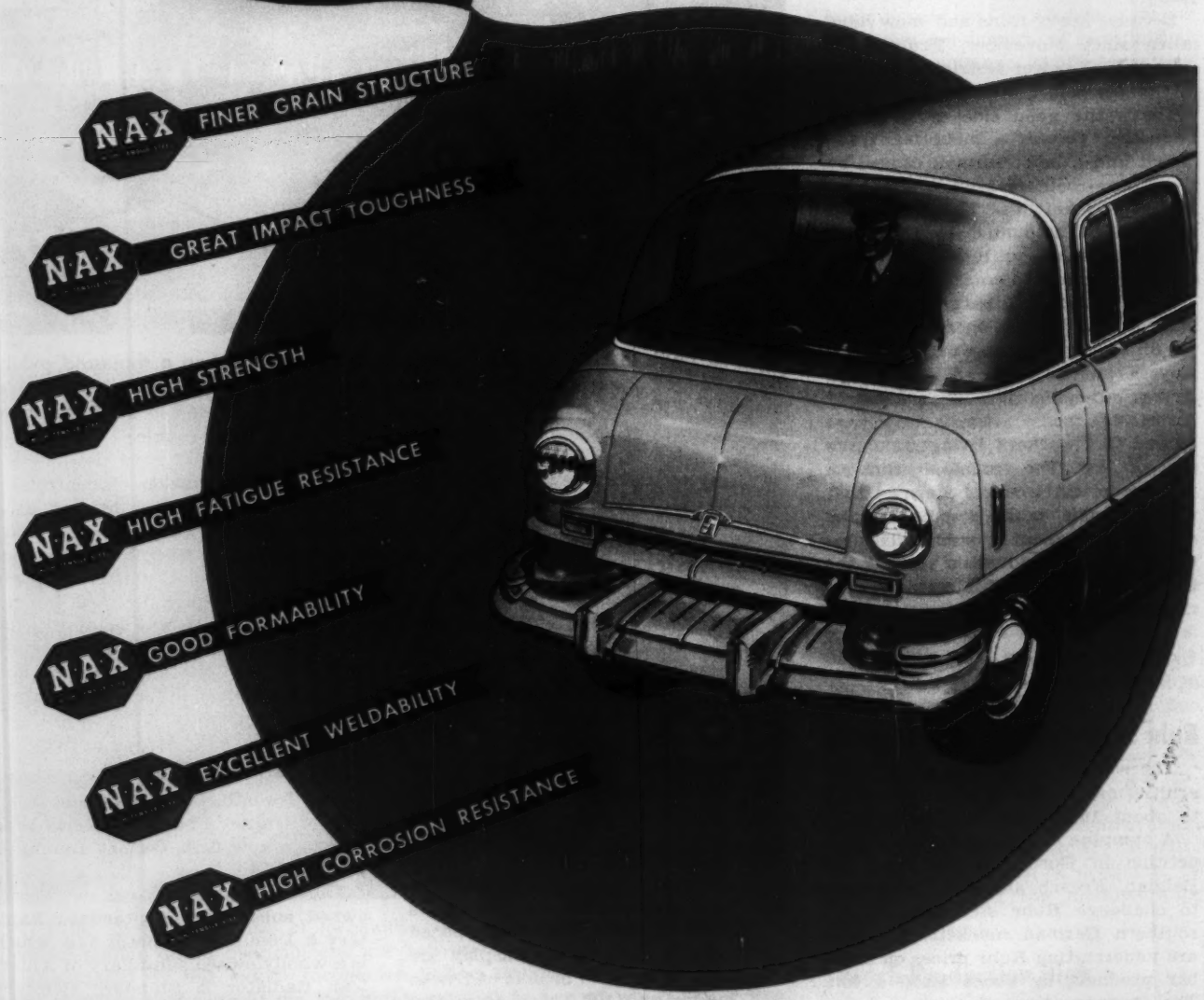
MAKE A TON OF SHEET STEEL GO FARTHER

Specify—

N-A-X

HIGH-TENSILE STEEL

SEVEN STRONG REASONS explain the trend to N-A-X HIGH-TENSILE steel in the manufacture of commercial vehicles.



GREAT LAKES STEEL CORPORATION N-A-X ALLOY DIVISION • ECORSE, DETROIT 29, MICH. • UNIT OF NATIONAL STEEL CORPORATION

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Willys-Overland, unlike other auto makers, finds the sales going rougher. It hopes for improvement with its restyled line, may introduce small light car

DETROIT

IN SHARP contrast to other manufacturers, Willys-Overland has been finding the sales going a little rough over recent months. Output of its utility line of vehicles in the first two months of this year was not much more than 3000 units, against 18,300 in the same period a year ago. Last week, however, a turn for the better appeared in the making as the company reviewed plans for staking out a broader claim in its traditional field by restyling the product line and introducing two new, more powerful, high-compression 4 and 6-cylinder engines which are calculated to set new standards for efficient fuel utilization.

Small Car Entry?—Changes in the line apply to the two-wheel drive station wagon with either engine, the Jeepster sports model, four-wheel drive truck and panel delivery truck. Also a new ½-ton truck with two-wheel drive was shown to the assembled dealer organization Thursday in Toledo. For the present the universal jeep and four-wheel drive station wagon will remain unchanged. Behind the scenes there was conversation hinting at the later introduction of a small light-weight passenger car and a four-wheel tractor, both powered by the new engines.

Of particular interest was the "F-head" design of the new 4-cylinder engine which Barney Roos, first vice president and director of engineering, said would challenge any automotive engine on the road in performance, endurance and fuel economy. The engine, providing 0.536 hp for each of its 134.2 cubic inches of displacement, is characterized by an extra-large 2-inch intake valve in the cylinder head, while the exhaust valve remains in the block. The design allows better "breathing" of the engine, with an increased intake charge at cooler temperatures permitting higher compression without detonation. Compression ratio is 7.4 to 1, with regular fuel. Service problems are reduced by the ready accessibility of the carburetor and simplicity of intake feeds in the head, and hot-spot heat troubles are avoided by more uniform tempering of the intake charge due to the entire wall of the inlet passages being held at even heat through thermostat action in the coolant system.

BARNEY ROOS AND HURRICANE
. . . KF will call it Supersonic

Revival—The F-head arrangement is not unknown in automotive engineering, but there have been no recent applications, and Willys thinks it will provide an 11 to 25 per cent reduction in gas consumption between full and partial throttle, while boosting horsepower by 14 per cent over the old L-head 4-cylinder engine. Horsepower rating is 72 at 4000 rpm. The engine also will be supplied to Kaiser-Frazer for use in the latter's forthcoming small Kaiser model. Willys has dubbed it Hurricane, K-F will call it Supersonic.

Increased compression in the engine is achieved through a smaller and more compact combustion chamber with the spark plug located squarely in the center. It can be readily adapted to still higher compression ratios when higher octane fuels become available. Already a ratio of 7.8 to 1 is available as an option for improved performance in high altitude areas.

Softer Lines—Outwardly the new Willys vehicles have been softened and streamlined in appearance. While wheelbase remains unchanged at 104 inches, overall length has been increased by bringing out the center vertical line of the grille 3 inches and projecting the front bumper 2 inches forward. A "V" theme is carried out in the radiator grille, front fenders and hood, with five heavy cross bars on the grille, chrome plated in the passenger cars, painted on the trucks.

Front edge of the hood has been rolled under for improved appearance and strength, while the angular lines of former front fenders have been softened by a "wind split" at the center, lowered front tip and rolled and drawn edges. Numerous refinements have been added to interior trim.

It should be mentioned that the new 6-cylinder engine continues in conventional L-head design, with 161-cubic inches displacement providing 75 hp at 4000 rpm.

Auto, Truck Output

U. S. and Canada

	1950	1949
January	610,211	445,092
February	504,954	443,734
March	606,000*	543,711
April		569,728
May		508,101
June		623,689
July		604,351
August		678,092
September		657,073
October		601,021
November		474,731
December		384,318
Total		6,533,641

Weekly Estimates

Week Ended	1950	1949
March 11	124,563	114,223
March 18	134,453	120,741
March 25	134,978	121,341
April 1	135,000	119,088

Estimates by Ward's Automotive Reports

* Preliminary.

Chrysler Builds Materials Bank

During the long tieup of its plants, Chrysler Corp. production planners, buyers, follow-up men and their staffs have been working energetically to build up a sufficient bank of materials and supplies so that when assemblies resume they can be pushed to a new high level in the effort to speed up the restocking of dealers, most of whom have been losing money hand over fist for the past two

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months. Just before the UAW-CIO pulled its members from Chrysler plants on Jan. 25, assembly schedules called for 7100 cars and trucks daily, a new high. Now the planning is for 8500 a day, higher by 20 per cent than the prestrike level. A materials and parts float approximating a month's requirements at the higher rate now is pretty well in hand. Some suppliers are stocking Chrysler material in their own plants, others are unable to do this and are shipping to Detroit-area warehouses which the company has rented.

Still Wants Steel—Steel companies report few if any cancellations of Chrysler tonnage, and beyond that it is reported the company has moved back into the ingot conversion picture to step up steel availability. It is rather anomalous that Chrysler should be contracting for expensive conversion steel while its plants are closed, but it shows the determination to effect a roaring start on assemblies and to hold them to the highest possible rate.

Production loss already has mounted to 300,000 cars and trucks, and even at the projected assembly rate it would take seven weeks to make up that deficiency. This brings up the question of how long the current model run will be continued. Best opinion is that it will move full tilt into late summer, to be followed by a shutdown for almost complete retooling of engines, chassis and bodies. Duration of the changeover to 1951 models could logically be gaged by the position of dealers' stocks at the time. If they are excessive, then a leisurely change would be expected, if not, then the 1950s and 1951s could be "sandwiched" as has been done during the postwar period.

Competitive Loss?—No one can say for sure just what the strike has cost Chrysler in terms of sales lost to competitors. Certainly there has been some loss, but many believe prospective Chrysler buyers are standing by and will flock to place orders when cars are available again.

One hitch which might develop is a labor shortage, preventing the achievement of high production schedules until sufficient recruitment of help can be realized. Many Chrysler workers shifted to other jobs, some returned to former homes in the South. There is no particular surplus of auto labor in Detroit now, once the idled Chrysler employees return to their jobs.

Ford Sells Bus Dies, Materials

Ford has sold its motor coach body dies, production materials for coaches and finished coach chassis to the Marmon-Herrington Co. Inc., Indianapolis. As a result, sale of coaches similar to those built by Ford will be continued by the Indiana producer. The new bus will be known as the Marmon-Herrington motor coach and will be distributed through former dealers of Metropolitan Motors Coaches Inc., national distributor of Ford coaches since September, 1947.

A 12-acre site in Cincinnati has been purchased by Ford for the construction of a service parts depot. Construction of a one-story building will start shortly and completion is scheduled for fall. About 130,000 sq ft of space will be provided and the latest types of materials handling equipment will be installed for receiving, filling and shipping parts orders coming from dealers in Kentucky and sections of Ohio, Indiana, Tennessee and West Virginia. More than 10,000 parts and accessories will be stocked at the new depot.

Shhhhh! It's Secret

Engineers submitting ideas for new devices, new materials and new techniques for consideration by the automotive industry say they are meeting increasing sensitivity from motor plants over possible legal consequences arising from even listening to new proposals. Some have been asked to sign waivers in advance of presentations against maintenance of secrecy over disclosures. In another case corespondence regarding new devices is returned accompanied by a form letter stating suggestions cannot be read before the submitter waives secrecy rights.

Steel Lack Hits Nash-Kelvinator

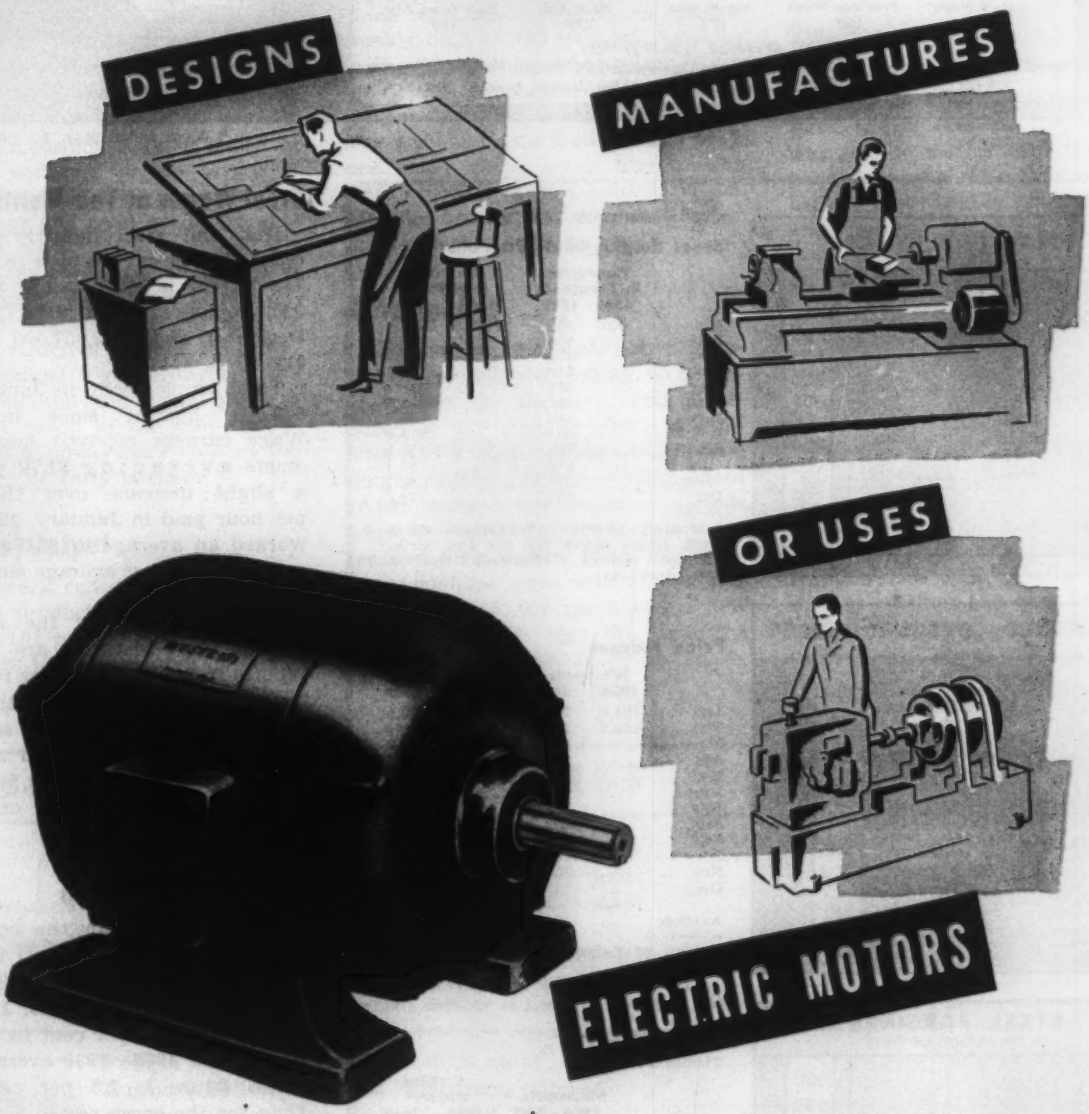
Declaring that insufficient steel supplies continue to be the principal deterrent to expanded production of automobiles and refrigerators, George W. Mason, president of Nash-Kelvinator Corp., Detroit, said last week that only 58 per cent of his company's March requirements of 19,000 tons could be purchased through regular mill channels. The balance of about 8000 tons came either from warehouses or via the ingot conversion route, both of which he termed "damned expensive."

Nash auto sales in the first ten days of March were 47.7 per cent above the same period a year ago, while Kelvinator is behind 70,000 units in refrigerator production. The company is starting a $5 million expansion program to boost Nash production at its main Kenosha, Wis., plant. The added facilities will provide 205,000 more square feet of manufacturing space and by October will be devoted to body production for the new series of low-priced Rambler models, scheduled for initial showing Apr. 14. Rambler bodies are now being assembled at the Nash Milwaukee plant.

BODY BEAUTIFUL: The new all-steel station wagon body now being made by Fisher Body begins to take shape at the Fisher Body plant, Euclid, O. Here, two employees weld metal sections into a strong, solid body. The Fisher plant is assembling the station wagon bodies for Chevrolet, Pontiac and Oldsmobile. It is also producing sedan delivery bodies for Chevrolet and Pontiac. All station wagon bodies are being converted from wood type to Unisteel body and turret top construction

HOW TO SAVE MONEY

IF YOU ARE A MAN WHO...

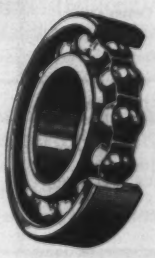


Nothing Rolls Like a Ball...

NEW DEPARTURE
BALL BEARINGS

NEW DEPARTURE
DIVISION OF GENERAL MOTORS
BRISTOL, CONNECTICUT

91

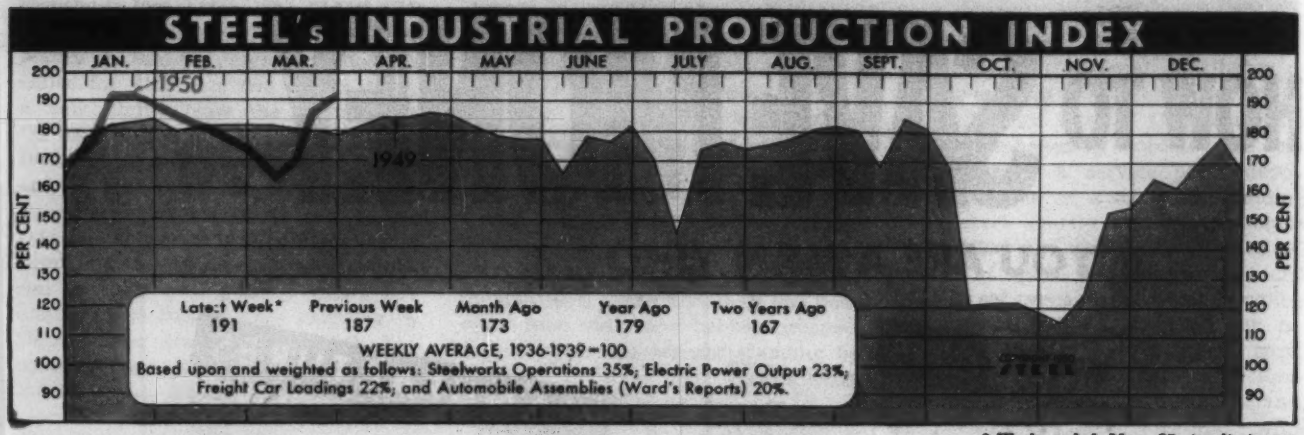


As almost everyone knows, many modern electric motors never need re-lubrication.

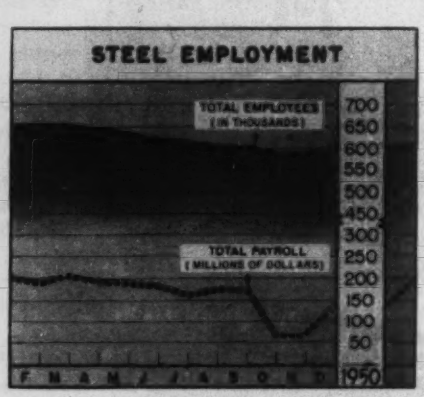
They run—an ever-increasing number of them—on New Departure self-enclosed ball bearings. For these are the bearings which (1) keep lubricant in, (2) keep dirt out, (3) reduce maintenance, and (4) simplify design.

These New Departure ball bearings save motor users money in several ways. They reduce lubrication costs to zero! They eliminate burnouts, costly repairs and lost time due to over or undergreasing. And they make motors last longer—as evidenced by numbers of installations that have been running for many years without attention.

Yes, you can save money by being certain the electric motors you design or manufacture or use are equipped with New Departure self-sealed ball bearings. Interesting booklet "Sealed" will be mailed on request.



* Week ended Mar. 25 (preliminary)

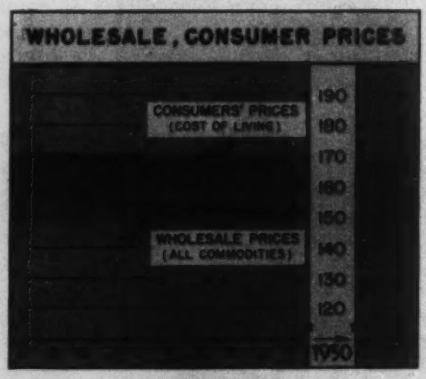


Charts—Copyright 1950, STEEL

Steel Employment, Payrolls

	Employees in Thousands		Payrolls in Millions	
	1950	1949	1950	1949
Jan.	609	650	$189.3	$202.1
Feb.	...	653	....	189.8
Mar.	...	652	....	207.2
Apr.	...	647	....	191.9
May	...	637	....	188.4
June	...	625	....	181.8
July	...	610	....	160.3
Aug.	...	603	....	175.6
Sept.	...	600	....	173.5
*Oct.	...	584	....	63.1
*Nov.	...	584	....	63.1
Dec.	...	602	....	136.9

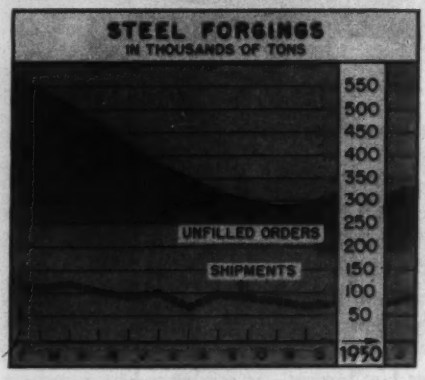
Monthly average. * Averages taken from single figure for the two strike affected months. American Iron & Steel Institute.



Price Indexes

	Wholesale		Consumers	
	1950	1949	1950	1949
Jan.	151.6	160.5	166.9	170.9
Feb.	152.7	158.1	166.5	169.0
Mar.	....	158.4	....	169.5
Apr.	....	156.9	....	169.7
May	....	155.7	....	169.2
June	....	154.4	....	169.6
July	....	153.4	....	168.5
Aug.	....	153.0	....	168.8
Sept.	....	153.6	....	169.6
Oct.	....	152.2	....	168.5
Nov.	....	151.6	....	168.6
Dec.	....	151.3	....	167.5
Average	....	154.9	....	169.1

Bureau of Labor Statistics



Steel Forgings

Thousands of Tons

	Shipments		Unfilled Orders*	
	1950	1949	1950	1949
Jan.	93	124	327	571
Feb.	..	111	...	540
Mar.	..	120	...	504
Apr.	..	104	...	465
May	..	92	...	412
June	..	101	...	377
July	..	70	...	348
Aug.	..	96	...	312
Sept.	..	88	...	294
Oct.	..	81	...	280
Nov.	..	73	...	287
Dec.	..	78	...	308

* For Sale. Bureau of the Census

Issue Dates of Other FACTS and FIGURES Published by STEEL:

Employ. Metalwkg .Mar.20	Ind. Prod. Index ..Mar.13	Radio, Television ..Mar.27
Constr. Valuation..Mar.20	Ironers, Standard ..Mar.20	Refrigerators, Elec..Mar.27
Durable Goods Mar.27	Machine Tools Mar.27	Steel Castings Feb.27
Fab. Struc. Steel ..Mar.6	Gray Iron Cast. ..Mar.6	Steel Shipments Mar.13
Foundry Equip. ...Mar.13	Malleable Cast. Mar.27	Trucks, Elec. Ind...Jan.2
Freight Cars Mar.20	Purchasing Power ..Mar.13	Wages, Metalwkg...Mar.20
Furnaces, Indus. ...Jan.2	Ranges, Electric ..Mar.27	Washers Mar.13
Furnaces, W. Air ..Jan.2	Ranges, Gas Jan.2	

Steel Wages at Ten-Month High

Iron and steel industry's payroll reached a ten-month high in January. The payroll is estimated at $189,346,000, compared with $184,750,000 in December and $202,057,000 in January, 1949.

Total employment in January was 609,400, highest since last July. Wage earners received hourly payments averaging $1.72 per hour, a slight increase over the $1.712 per hour paid in January, 1949. They worked an average of 38.5 hours per week, the highest average since April, 1949.

Data, compiled by the American Iron & Steel Institute, are based on reports from 114 companies representing about 93 per cent of the industry's capacity. They cover employees engaged in the production and marketing of iron and steel, excluding mining, shipbuilding and other non-steelmaking activities.

Consumer Prices Dip

Further easing in the consumers' price index (cost of living) is reported by the Bureau of Labor Statistics. Between Jan. 15 and Feb. 15 the index declined 0.2 per cent to 166.5 per cent of the 1935—1939 average. The latest figure is 1.5 per cent lower than for the same period a year ago.

Chiefly responsible for the decline during the month was a drop of 0.6 per cent in food prices and a fractional decrease in apparel prices.

The bureau's comprehensive wholesale price index advanced 0.8 per cent from January to February to 152.7 per cent of the 1926 average. Gains in the farm products and food groups of 2.8 and 1.3 per cent, respectively, caused most of the rise. Fractional advances were recorded in metals and metal products, building materials and house furnishings. Remaining groups that make up the wholesale price index were either unchanged or declined fractionally.

The Business Trend

Big puzzler for the metalworking industry is how long will the boom last? Only the most optimistic expect it to go very far into second half

BARRING strikes it appears that business will ride out the first half in high gear. Forecasts for the second half vary but few metalworking firms expect to maintain operations at the first half pace. The present pattern of consumer buying indicates the drop will not be too severe in metalworking. People are spending more money and hard goods are getting a big play.

Appliances and automobiles are in great demand even with plants operating at capacity. High rate of home construction should keep appliance demand high throughout the summer months and some quarters forecast a pinch in the more popular makes of low priced cars in the late spring or early summer.

Industrial Output . . .

In the week ended Mar. 25 STEEL's industrial production index gained 4 points to 191 per cent (preliminary) of the 1936-1939 average. This is the highest point attained by the index since mid-January when an alltime weekly high of 192 was set. Advance in the steelmaking rate accounted for all of the gain, other classifications making up the index held steady. The big difference between this peak and other times when high marks were recorded is that automotive assemblies are not the dominant factor in the week's performance.

Automobiles . . .

Outturn by the automotive companies currently operating is at capacity but the industry total is reduced by the Chrysler strike. Assemblies are holding around 135,000 passenger cars and trucks weekly, about 20,000 units below previous periods when the industrial production index reached high points. Even if Chrysler assemblies were only at the prestrike pace (35,000 per week) a new assembly mark for the industry would be set with room to spare. As soon as Chrysler resumes, it will drive for about 43,000 units per week and what is more the company has the inventories to make this goal possible.

Steelmaking . . .

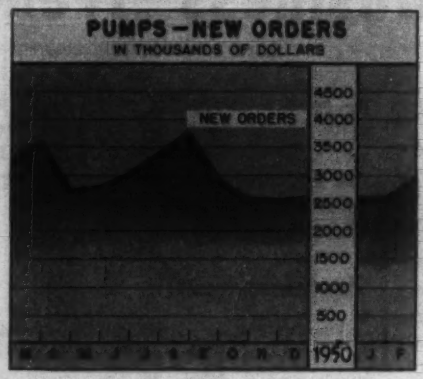
Production of steel for ingots and castings is near capacity. In the week ended Mar. 25 the ingot rate was 96 per cent of capacity, highest point this year. This rate is 6 points higher than in the preceding week and represents a weekly tonnage near the alltime high attained in March, 1949. Operations at or near the present rate may be maintained through the second quarter.

Coal . . .

Supplies are no longer a problem but what to do with the coal industry is a puzzler that is coming up with a rush. The gap between production to date this year and that for the like 1949 period is closing rapidly. Mines can and are producing about 13 million tons of bituminous coal weekly—more than the

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	96.0	90.0	85.5	101.0
	Electric Power Distributed (million kilowatt hours)	5,993	6,015	5,854	5,403
	Bituminous Coal Production (daily av.—1000 tons)	2,218	2,200	404	498
	Petroleum Production (daily av.—1000 bbl.)	4,848	4,827	5,000	5,188
	Construction Volume (ENR—Unit $1,000,000)	$177.3	$213.2	$263.6	$180.9
	Automobile and Truck Output (Ward's—number units)	134,978	134,453	125,285	120,341
	*Dates on request. †1950 weekly capacity is 1,906,267 net tons. 1949 weekly capacity was 1,843,516 net tons.				
TRADE	Freight Car Loadings (Unit—1000 cars)	721†	726	547	596
	Business Failures (Dun & Bradstreet, number)	186	208	210	166
	Money in Circulation (in millions of dollars)‡	$26,972	$27,023	$27,019	$27,423
	Department Store Sales (changes from like wk. a yr. ago)‡	+1%	−1%	+2%	−16%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$15,805	$13,115	$12,693	$14,088
	Federal Gross Debt (billions)	$255.9	$255.9	$256.5	$251.8
	Bond Volume, NYSE (millions)	$22.8	$23.0	$16.0	$14.4
	Stocks Sales, NYSE (thousands of shares)	9,306	8,295	6,316	4,204
	Loans and Investments (billions)†	$66.9	$66.3	$67.0	$61.7
	United States Gov't. Obligations Held (millions)†	$36,877	$36,463	$36,975	$32,680
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	156.13	156.13	156.13	154.85
	STEEL's Nonferrous Metal Composite‡	157.4	157.1	159.7	220.4
	All Commodities†	151.7	152.0	152.5	158.3
	Metals and Metal Products†	169.6	169.3	169.4	174.4
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.				

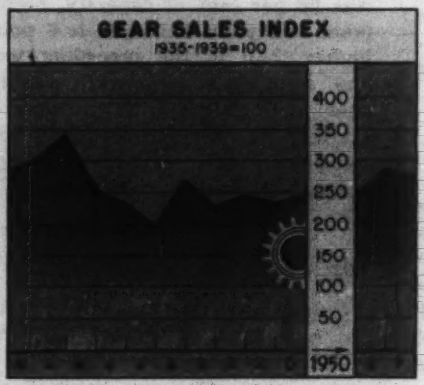


Pumps, New Orders

In Thousands of Dollars

	1950	1949	1948
Jan.	2,586	3,390	3,819
Feb.	2,938	3,247	3,635
Mar.	....	3,593	4,703
Apr.	....	2,899	4,312
May	....	2,775	3,724
June	....	3,019	3,512
July	....	3,358	4,075
Aug.	....	3,767	4,520
Sept.	....	2,914	3,474
Oct.	....	2,539	3,571
Nov.	....	2,525	3,580
Dec.	....	2,560	4,263
Totals	....	36,386	47,188

Hydraulic Institute



Gear Sales Index

1935—1939=100

	1950	1949	1948
January	280.2	320.7	346.8
February	272.9	282.3	324.4
March	....	299.1	389.8
April	....	339.0	320.9
May	....	250.1	283.6
June	....	227.8	324.1
July	....	193.1	384.4
August	....	262.0	335.6
September	....	224.9	320.4
October	....	242.3	333.3
November	....	230.7	309.0
December	....	242.8	325.9

American Gear Mfrs. Assoc.

Standard Vacuum Cleaners

Sales Billed—Units

	1950	1949	1948
Jan.	249,150	228,769	304,273
Feb.	263,515	241,267	311,448
Mar.	.....	309,897	355,415
Apr.	.....	252,656	308,588
May	.....	222,850	276,657
June	.....	207,354	256,071
July	.....	161,920	229,537
Aug.	.....	219,909	237,202
Sept.	.....	250,036	280,084
Oct.	.....	272,520	281,573
Nov.	.....	253,516	255,080
Dec.	.....	265,513	273,890
Total	.....	2,886,514	3,360,859

Vacuum Cleaner Manufacturers' Assoc.

Charts—Copyright 1950, STEEL

market can absorb. A few mining curtailments have already been announced but these are too few to bring supply and demand into balance. Some of the administration's best minds are giving the situation their careful attention. It's a cinch that some sort of "stabilizing" move is forthcoming but no bets are being taken as to what it will be.

Business . . .

Business failures declined slightly in February to 811 from 864 in January reports Dun & Bradstreet. The decline in manufacturing and mining failures was sharper to 170 in February from 225 in January. There was a decline in industrial failures in February in all lines except transportation equipment and the manufacture of iron and steel.

Cleaner Sales Rising

Improvement in standard-size household vacuum cleaner sales continued in February. Vacuum Cleaner Manufacturers' Association totals show sales in the latest month reported were 263,515 units, up 5.7 per cent over 249,150 cleaners sold in the preceding month and 9 per cent higher than in February, 1950.

Sales for the first two months this year were 8.9 per cent higher than in the like period a year ago. This year's total is 512,665 units, compared with 470,343 in the first two months of last year.

Engineering Awards Soar

Private contracts set the pace, topping first quarter 1949 total by more than 50 per cent

ENGINEERING construction contracts are being awarded in good volume and will aid in keeping metalworking activity at high levels in 1950. Private awards to date top public awards both in dollar volume and percentage gain over the like period in 1949. Even plant construction is slightly higher than in the first quarter 1949 despite earlier predictions that this category would be down 10 to 15 per cent.

Competition for work is intense but that means business for equipment builders. With high labor costs and pared profit margins, builders will find it necessary to properly utilize efficient equipment to keep their heads above water.

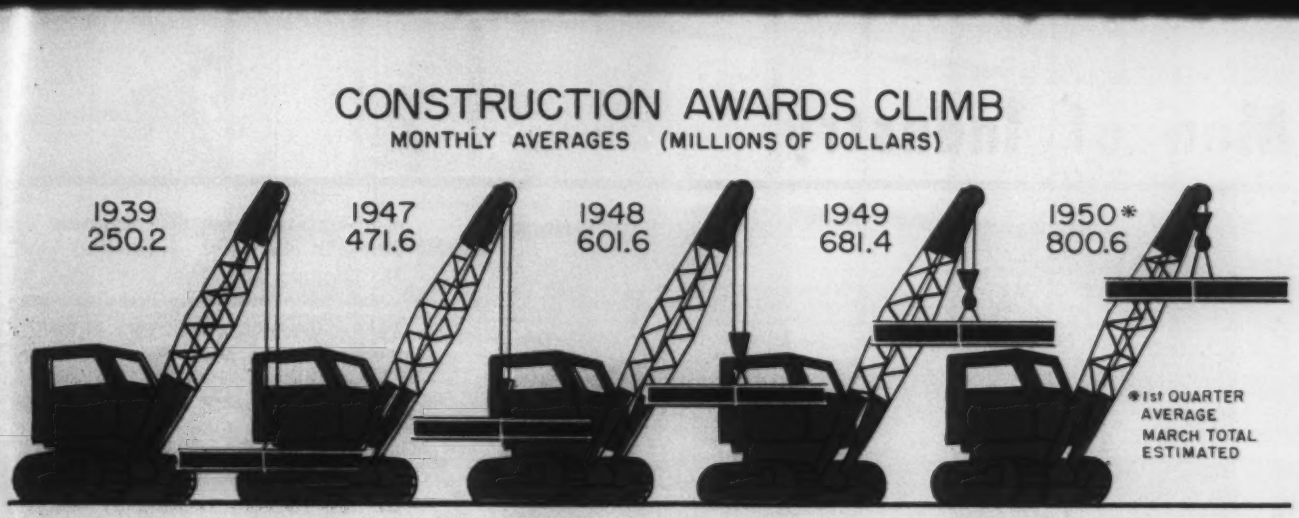
Running Ahead—The monthly average for the first quarter this year is running ahead of the monthly averages for the postwar years and is more than three times as high as prewar. As shown in the accompanying chart, engineering awards have been higher in each postwar year than in the preceding year. In all these years the first quarter average has been below the final, and if the pattern is followed this year the 1950 monthly average will climb still higher.

Contract awards in January and February were $915.5 and $686.2 million, respectively, and the March total is estimated at $800 million. The cumulative total for the first quarter is 28 per cent higher than in the like period a year ago.

Private construction for the first 12 weeks of 1950 totals $1307 million and public construction $1028 million. Each category tops awards for the corresponding period a year ago, private by 52 per cent and public by 13 per cent.

Down from 1949—Fabricated structural steel bookings in the first two months of this year aggregated 228,362 tons, down about 17,000 tons from the 1949 figure, says American Institute of Steel Construction. A sizable number of jobs are in the offing, improvement is noted in both public and private inquiries. Profit margins are shrinking because of fierce competition for contracts. Some observers think fabricators are operating on little or no profit just to get the jobs.

Because of this spirited competition among fabricators, the prime contractors are able to get lower



prices than they originally estimated. Whether this condition will continue or will disappear when more of the larger jobs are placed is anybody's guess. One result of this competition is that heavy engineering costs are being maintained at former levels and not rising apace with home building costs.

Higher Home Building Costs

Home building which has maintained a record pace on the West Coast since late last fall is bringing higher prices. Further expansion in residential work, expected in the next few months, probably will result in additional cost increases. Demand for almost all materials is extremely heavy and some supplies are relatively restricted.

Cost increases vary but the average rise is between 4 and 5 per cent, compared with last spring. The biggest advance is in lumber which is up about 25 per cent.

Items like steel sash are up 2 to 3 per cent, nail prices have advanced 4 to 5 per cent and plumbing materials are about 5 per cent higher. Builders report discounts have been eliminated or reduced on many materials.

Labor supply is generally good, only spotty shortages exist for some types of workers. In these cases contractors have to pay premium wages. As construction expands this spring, worker scarcities will grow and cause an overall increase in labor costs.

Builders in most cases are passing along higher costs to buyers although buyers are resisting. Generally the additional cost on a $9000 house is from $200 to $300.

These trends in home building are running counter to prospects that heavy construction costs will remain at a lower level this year. Bidding on large projects has hammered the price to the purchaser down an average of 10 per cent and West Coast engineering contractors are being forced to absorb rising materials costs.

Employment Prospects Better

Employment prospects are brighter in the San Francisco bay area. A survey made by the Bay Area Council indicates a number of major manufacturing lines will begin adding workers soon. The council's report indicates the unemployment peak was reached in January and February.

Substantial improvement already is underway in construction industries and a heavy need for workers is expected in food processing later this spring and during the summer. Chemical, machinery and metal fabricating plants predict employment gains in the near future.

Assembly Rate Going Up

A five-fold increase in room air conditioner production is planned by Fedders-Quigan Corp., Buffalo. The plant's peak capacity last year was 100 units a day. A rate of 500 room air conditioners daily is expected to be attained some time this month.

Output Up Despite Changeover

Changeover to 21 new or redesigned appliances without a shutdown or major delay is reported by C. B. Dick, works manager, Westinghouse East Springfield, Mass., appliance plant. In addition while the 1950 models were spreading throughout the plant's various departments, overall plant production was increased substantially compared to the closing weeks of 1949. Employment increased 10 per cent to its present 3900 level.

"The number and variety of changes which have been made are far more extensive than any series of peacetime product modifications we have ever experienced in the East Springfield works," Mr. Dick says. The plant is producing: Two new refrigerator units, one new and one redesigned vacuum cleaner, three new and six redesigned fans, two new water coolers, an improved garbage disposal unit, four redesigned soft drink coolers and one new soft drink bottle vending machine.

Recovery Rapid

March business was near January's high levels. Great expectations for next two months

INDUSTRY'S recovery from the slowing effects of the coal strike was rapid and the pace will continue to accelerate in the next two months, say the nation's purchasing executives. National Association of Purchasing Agents survey committee reports further that March business was near the high record set in January and above both February and December.

No great damage was done to business by the coal strike say purchasing agents. Coal began to move just as the shortage started to hurt. Postponements of deliveries and ordering of finished goods were the only signs of any general setback. Business irrevocably lost was small and of a consumer nature.

Commodity prices are going slightly upward, but indications are that they will level out. Inventories are almost static, although some tendency to build up is reported. Almost three-fourths of the purchasing agents surveyed report a buying policy within a 60-day range. There are slight additions to those reporting in the 90 and 120-day bracket.

In looking at future prospects, the majority opinion among purchasing executives is that business will be good and reaching upward through April and May, possibly leveling off in June. A somewhat more than seasonal decline is forecast in July. A few expect fair business well into the third quarter.

Men of Industry

O. C. BERKOBEIN

WALTER J. KIMPEL

O. C. Berkobein, who for many years has served as president as well as sales director of **U. S. Steel Wire Spring Co.,** Cleveland, is now relinquishing his sales duties and will devote his time to overall policy planning and direction of the company's entire operation. **Walter J. Kimpel** was appointed sales manager. He has been associated with the spring industry for over 35 years and until recently was sales manager of Cleveland Wire Spring Co.

—o—

C. M. Baker was appointed chief engineer, Kalamazoo, Mich., works, **Ingersoll Steel Division,** Borg-Warner Corp. He succeeds **L. C. Freeman,** who recently reached the retirement age. Mr. Baker was assistant chief engineer responsible for directing research and product development of Ingersoll's line of gas, oil and coal furnaces and winter air conditioners.

—o—

Electric Products Co., Cleveland, appointed **E. G. Schroeder** sales manager of the company, responsible for all headquarters and field direct sales activities. He previously was field sales manager.

—o—

Melvin C. Harris was appointed works manager of the Cleveland mills of **Chase Brass & Copper Co. Inc.,** succeeding **William F. Aylard,** named chief engineer of the company. Mr. Harris had been associated with Allegheny Ludlum Steel Corp. at Pittsburgh as vice president in charge of operations.

—o—

Edward W. Phillco has been appointed vice president and general manager of **General Electric Medical Products Co.,** which recently moved to Milwaukee from Chicago. He has been manager of the California district for General Electric X-Ray Corp., parent company.

—o—

Karl Kesselring was appointed general factory manager, and **Gordon G. Lohmiller** as planning manager, **SKF Industries Inc.,** Philadelphia. Mr. Kesselring succeeds **John Lawrence,** named technical vice president, while Mr. Lohmiller assumes planning duties formerly held by the new factory manager.

—o—

Baker Industrial Truck Division of Baker-Raulang Co., Cleveland, announces election of **Robert H. Davies** as vice president and acting general manager, and **Edward H. Remde** as vice president. Mr. Davies joined Baker-Raulang last June as manager of engineering with supervision of all engineering functions of the company. Just previous to joining Baker-Raulang he was with Lincoln Electric Co. serving as its Washington representative, and as consulting engineer in charge of educational work. Mr. Remde this year completes 50 years of continuous service with Baker-Raulang. He was appointed works manager in 1938.

—o—

Northrop Aircraft Inc., Hawthorne, Calif., elected **John W. Myers,** vice president in charge of customer relations, to the board of directors to fill the vacancy created by resignation of **C. N. Monson. Kenneth Brown,** formerly assistant vice president in charge of manufacturing, was named vice president to replace **B. G. Reed; Roland J. Pagen,** treasurer-controller, was elected a vice president and treasurer; and **George T. Johnson** was named controller.

—o—

Clifford B. Mueller Jr. will become general sales manager, **Brunhoff Mfg. Co.,** Cincinnati, effective Apr. 10. He has resigned as general sales manager, Schaible Co. and its D. T. Williams Valve Co. division.

—o—

Leo B. Glaser was appointed manager of the new Neg'ator Division, **Hunter Spring Co.,** Lansdale, Pa.

—o—

Roland A. Hazell was named manager of the new Buffalo branch sales office of **National Radiator Co.**

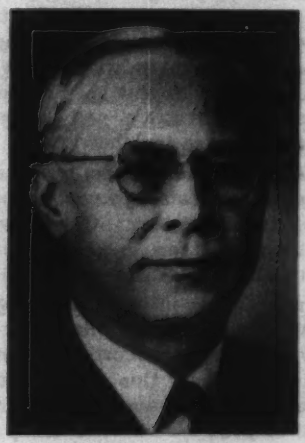
—o—

W. F. Strong was transferred to the Dallas office of **General Electric Co.** as an application engineer in the southwestern district.

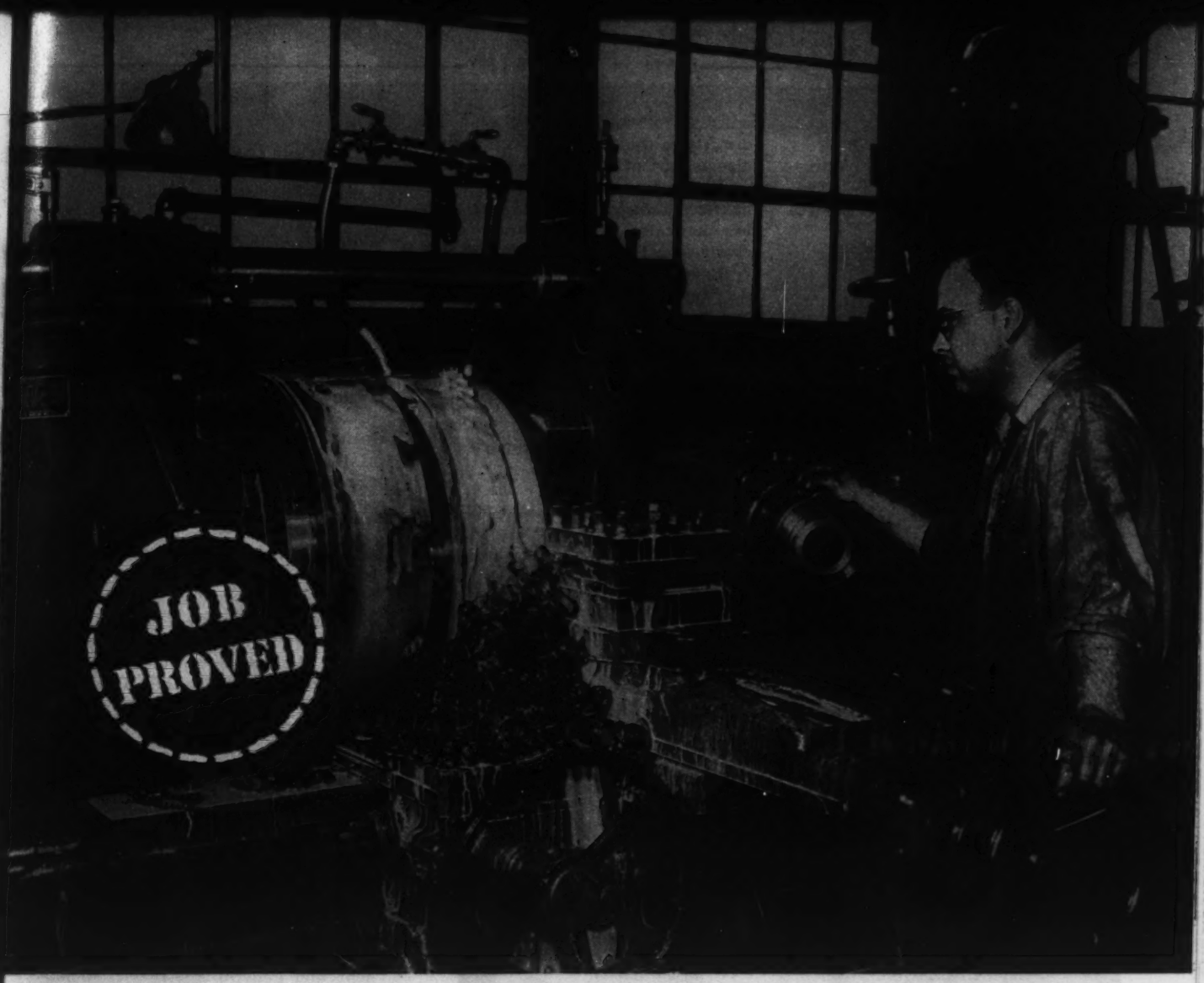
—o—

H. N. Mallon has resigned as a director of **White Motor Co.,** Cleveland. He is president of Dresser Industries Inc., and is moving his headquarters to Dallas. **John O. Ekblom** of New

ROBERT H. DAVIES



EDWARD H. REMDE



S.E.C.O. BEATS COSTLIER CUTTING OIL

Competitive Product Fails to Match Fine Record of Sunoco Emulsifying Cutting Oil in Cost or Performance

For 27 years a metalworking shop used Sunoco Emulsifying Cutting Oil with complete satisfaction on difficult operations. The following is a typical example:

Machine: Gisholt turret lathe, model 4L.
Part: 20" press mold shell 22⅛" O.D. x 6" wide x 20½" I.D.
Operation: Turning, boring rough forgings.
Material: 40-50 carbon steel.
Tools: Firthite carbide tools.
Feed: .012 at 31 rpm.
Cut: ½" to ¾" on O.D. and boring.

Tool life was excellent. Machines stayed clean. High production, with minimum scrap, was the rule year in and year out.

Two years ago the shop was persuaded to try a competitive oil on the above operation. Test results showed that the competitive oil, costing three times as much, lacked stability. Performance was far inferior to that of Sunoco Emulsifying Cutting Oil in regard to tool life and quality of finish. The company was quickly convinced that its original choice had been sound.

In all machine shop operations, on both ferrous and nonferrous metals, you'll find Sunoco Emulsifying Cutting Oil and Sunicut* straight cutting oils of real assistance. They help maintain production schedules, lengthen tool life, and keep operating costs down. For a free Sun cutting oil recommendation card, write Dept. S-4.

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"JOB PROVED" IN EVERY INDUSTRY

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York was elected to fill the vacancy created by Mr. Mallon's resignation.

—o—

Robert H. Morse Jr. was elected president, **Fairbanks, Morse & Co.**, Chicago. He has been serving as vice

ROBERT H. MORSE Jr.

president in charge of operations, and previously was vice president in charge of sales, assistant general sales manager, and held many other positions. His father, **Col. Robert H. Morse,** whom he succeeds, becomes chairman of the board.

—o—

Douglas A. Jones, formerly associated with the Steel Co. of Canada, returned to private industry when federal steel controls expired Mar. 31. He has been serving as steel controller of Canada.

—o—

John R. Hewitt was appointed general superintendent of blast furnace and heavy construction for **Affiliated Furnace & Engineering Inc.**, Pittsburgh.

—o—

Edgar H. Lloyd was elected president, **Pacific Tube Co.**, Los Angeles. Prior to his present position he served since 1943 as superintendent, and for the last two years was vice president in charge of operations.

—o—

W. J. Mullen was appointed sales representative covering New York state for **Hynes Steel Products Co.**, and **Roll Formed Products Co.**, subsidiary, both of Youngstown. He replaces **Paul C. Schoenfeld,** resigned.

—o—

Kaiser Steel Corp., Oakland, Calif., announces promotion from sales manager of southern California district to assistant general sales manager of **J. J. Carlson,** who will have headquarters in Oakland. He is succeeded in Los Angeles by **C. Lee Emerson,** who served as manager of rolled product sales in Oakland. **R. L. Asquith** will devote full time as manager of tubular sales, reporting directly to the general sales manager; also as part of the increased emphasis on pipe sales, an office will be established in Tulsa, Okla., with **J. H. Webber** as sales representative. Other changes include appointment of **Harry Beyma** as manager of rolled product sales, with offices at Oakland, and **O. D. Hole** succeeding Mr. Beyma as manager of cold rolled strip sales with offices in Los Angeles. At the same time Kaiser Steel Corp. announces establishment of its New York sales office as a division sales organization under the direction of **W. F. Pelletier.**

—o—

Claude E. Monlux, vice president, Linde Air Products Co., New York, was elected president of **International Acetylene Association,** New York. He had served as vice president for the year 1949. **James W. Dunham,** vice

CLAUDE E. MONLUX

president, National Cylinder Gas Co., Chicago, was elected vice president of the association. **E. V. David,** assistant manager, technical sales division, Air Reduction Sales Co., New York, was re-elected treasurer, and **H. F. Reinhard** was re-elected secretary.

—o—

Harold J. LaCasse joined **Pennsylvania Salt Mfg. Co.'s** special chemicals department as field sales service representative in the Indiana territory. He takes over the territory relinquished by **John C. Hampson,** recently appointed sales manager of the department's newly formed Chicago district.

—o—

Chester W. Schweers, manager, Los Angeles district, **Allis-Chalmers Mfg. Co.,** was named manager of the company's New England region with headquarters in Boston. He succeeds **W. F. Taylor,** resigned, who, with **A. B. Frost,** Boston manager, also resigned, are establishing their own business.

—o—

Columbia Steel Co. announces promotions in its Los Angeles sales office. **Loring S. Brock** and **L. W. Hall** will head account groups in the division; **M. J. Cover** was appointed division staff manager, and **Dan M. Petrakis** was named service manager.

—o—

George H. Tulley was promoted to manager, Cleveland office, **Metals Disintegrating Co. Inc.** He will serve its customers in the metallic pigment field in the Cleveland territory, at the same time retaining his position in the company as powder sales supervisor.

—o—

Pullman-Standard Car Mfg. Co., Chicago, appointed **James E. Candlin Jr.** as deputy director of research, in addition to his other duties as associate director, mechanical division; **Ralph Haman** as consultant for design and styling to the director of research; and **Fred Girardy** as acting associate director, styling and architectural division.

—o—

A. G. Zumbrun, chairman of the board and executive vice president, **Brunner Mfg. Co.**, Utica, N. Y., was elected president succeeding **George L. Brunner Jr.,** who resigns as president and a director.

—o—

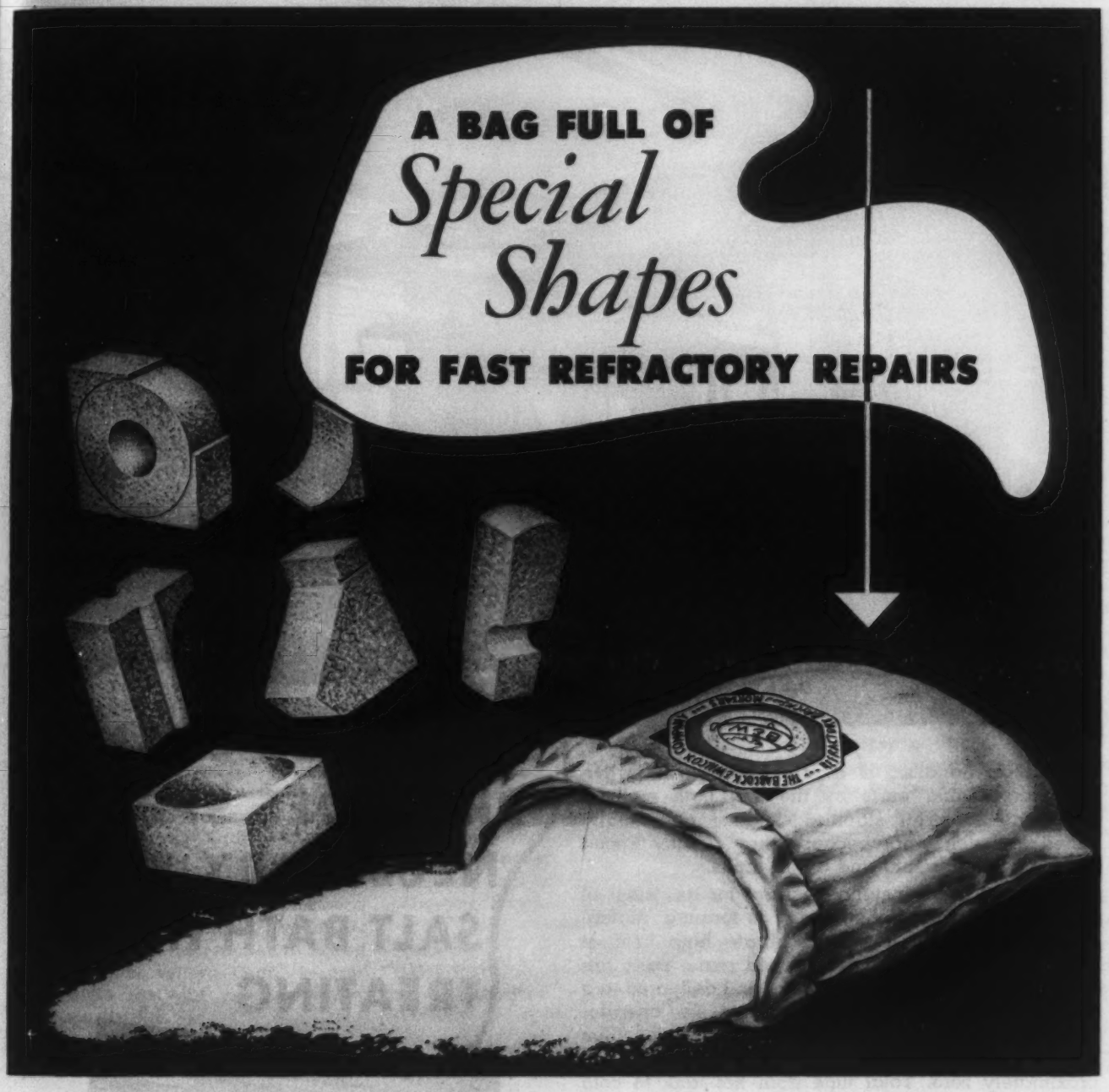
O. S. Dollison, formerly vice president and general manager, Republic Rubber Division, **Lee Rubber & Tire Corp.,** Youngstown, was elected vice president of Lee Rubber & Tire Corp.,

O. S. DOLLISON

with headquarters at Youngstown. STEEL, Mar. 13 issue, incorrectly reported Mr. Dollison elected to the presidency of the corporation.

—o—

Perfex Corp., Milwaukee, elected **Ar-**



WITH KAOCAST ON HAND, you don't have to carry an expensive inventory of special refractory shapes. You can make your own! This versatile 3000 F Refractory Castable can be used to mold shapes quickly and easily in your own shop . . . or it can be applied directly to the furnace lining by cement gun or by casting into place. In addition to cutting the cost of repairs, KAOCAST will increase furnace life because of its high resistance to spalling and slag attack.

And remember, KAOCAST is just one of B&W's *complete* line of Refractory Castables, all designed to reduce construction and maintenance costs in low, intermediate, and high-temperature furnaces.

If you have a problem with special shapes, investigate the cost cutting advantages of B&W Refractory Castables. For more information call your local B&W Refractories Engineer, or simply drop us a card asking for Bulletin R-22.

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R-374

STABILIZED CRANE PROVIDES SPEED NECESSARY FOR SALT BATH HEAT TREATING

SPEED in handling is a primary requisite when heat treating parts by the salt bath method. Cleveland Tramrail stabilized cranes are ideally suited for such work because they greatly speed handling of parts into and out of tanks.

Illustrated is an installation used for treatment of aluminum parts and sheets prior to forming. Materials are soaked in a sodium nitrate bath held at 920° F. By means of the stabilized crane parts are quenched in two cold water tanks and delivered to a point just outside of a refrigerator room. The operator takes them from the basket and quickly places them into this room where the temperature is kept at approximately zero. Total time from hot tank to cold room must be kept under four minutes, to prevent parts from hardening prematurely.

The Cleveland Tramrail stabilized crane is particularly advantageous for this work as well as for anodizing, chromodizing and other tank operations, because it will raise and lower loads quickly like an elevator, without swing.

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THE CLEVELAND CRANE & ENGINEERING CO.
7852 EAST 284th STREET, WICKLIFFE, OHIO

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

thur J. Brennan as a vice president. He has been works manager.

Marshall L. Noel has joined **Tractomotive Corp.**, Deerfield, Ill., as vice last 12 years, and had his headquarters in Dayton, O.

R. S. STEVENSON

MARSHALL L. NOEL

EDWARD W. HOLLIS

R. S. Stevenson was appointed general sales manager, tractor division, **Allis-Chalmers Mfg. Co.**, Milwaukee. He succeeds **Marshall L. Noel**, recently resigned. Mr. Stevenson joined Allis-Chalmers in 1933. He has been assistant general sales manager since the fall of 1948.

—o—

Frank S. Foster, assistant sales manager, eastern division, **Caterpillar Tractor Co.**, Peoria, Ill., was appointed assistant sales manager, western division, replacing **Truman E. Sage**, who is resigning from Caterpillar Tractor Co. to join the Caterpillar distributor for Alaska, Northern Commercial Co., Seattle. **Gordon J. Fowler**, district representative in the San Joaquin valley,, Calif., is promoted to assistant sales manager, eastern division.

president and treasurer. He previously spent more than 21 years with the tractor division, Allis-Chalmers Mfg. Co., Milwaukee, of which he was general sales manager, and also was vice president of the company.

—o—

Capt. Alfred F. Olivet, USNR, and **John P. Ahrens** were elected directors of **American Cladmetals Co.**, Carnegie, Pa.

—o—

James R. Williams was appointed sales promotion manager, **Signode Steel Strapping Co.**, Chicago, and will hold this position in addition to directing advertising and publicity.

—o—

John J. Coy was named assistant sales manager, **American Screw Co.**, Providence, R. I. He was a sales representative of the company for the

Edward W. Hollis, for the last two years vice president of Laminated Plastics Inc., has been named manager of the rubber division, **Parker Appliance Co.**, Cleveland, with particular attention to production matters. **D. W. Holmes**, general sales manager, has assigned to **E. L. Carlotta**, the division's research and development engineer, the additional responsibilities of managing rubber sales. **Don C. Pierce Jr.** has joined the company as a rubber sales engineer. For the last year he has been sales manager for Cleveland Republic Tool Corp.

—o—

Imperial Brass Mfg. Co., Chicago, elected **James T. Greenlee** vice president and a director. With the company since 1910, he is in charge of industrial sales in automobile, truck, tractor and refrigeration fields.

OBITUARIES...

Francis E. Gallagher, 65, chairman of the board, **Behr-Manning Corp.**, Troy, N. Y., died Mar. 23. He had retired Jan. 1 as president and general manager.

—o—

Woodforde H. Plant, 65, president and general manager, **Brazaco, S. A.**, Rio de Janeiro, Brazil, general distributor in Brazil for U. S. Steel Export Co., U. S. Steel Corp. subsidiary, died Mar. 24 in Sao Paulo following an operation.

—o—

Ernest L. Knight, 48, long associated with Pacific Car & Foundry Co., and for the last four years sales manager, **Western Steel Casting Co. Inc.**, Seattle, died Mar. 21.

—o—

Lionel E. Goodrich, 56, former production manager, **Brown-Lipe Chapin Co.**, and former vice president, **Rollway Bearing Co.**, both of Syracuse, N. Y., died recently.

—o—

Carl H. Hoffstetter, 74, president, **Odin Stove Co.**, Erie, Pa., which he founded around 1900, died Mar. 19.

—o—

Edward M. Smith, 69, president, **Globe Oil Tools Co.**, Los Nietos, Calif., died Mar. 17. He was founder of Emsco Steel Products Co. and Emsco Tool Co., of Los Angeles, which later merged as Emsco Derrick & Equipment Co.

—o—

William Hamilton, 84, retired president, **Erie Car Works**, Erie, Pa., died Mar. 24.

—o—

P. C. Haldeman, 70, who retired in July as chief engineer, **Lukens Steel Co.**, Coatesville, Pa., died Mar. 26. He was with Lukens 48 years.

—o—

Gustav O. Wilms, 69, retired chief engineer, **Allen-Bradley Co.**, Milwaukee, died Mar. 13.

—o—

Dr. F. M. Potter, 76, vice president in charge of engineering research and development, **General Cable Corp.**, Rome, N. Y., died Mar. 18.

—o—

Leroy W. Luff, 50, a metallurgist for 27 years with **International Nickel Co.**, New York, died Mar. 23.

—o—

Edward A. Horne, 51, assistant treasurer, **Inland Steel Co.**, Chicago, died Mar. 26.

—o—

Florian Rathmann, 48, superintendent, **M. J. Grass Screw Machine Products Co.**, Buffalo, died Mar. 23.

THOUSANDS OF LEADING MANUFACTURERS ARE NOW USING TURCHAN EQUIPMENT

Patent Pending

Dual Turning Follower converts lathes to produce work of greater variety, faster, at increased accuracies

Your present lathes when equipped with the new Turchan Dual Turning Follower can revolutionize production of contour turning problems. No more need for specially built machines and costly form tools. No special training of men is required. Job set-up is reduced to a fraction of former time.

Contours are generated from a template by means of a hydraulically controlled cutting tool. The cross slide is equipped with 2 compounds mounted at 45° to center line and 90° to each other, replacing the conventional slide. This creates a **new combination** of movements.

Now, for the first time, with the Turchan Dual Turning Follower, tool approach to the work is **doubled.** Any shape on left or right of center, or on the face, or a combination of both, can be machined with the simplicity of straight work.

Greater accuracies are possible due to increased rigidity of operation. Tracer movements of cross slide are independent of mechanical movements of carriage. This is especially important in slight motion as the cutting tool responds quickly and accurately, giving a smooth, stepless finish. Size of work is limited only by the capacity of the machine.

There is a Turchan Follower hydraulic attachment for conversion of any standard lathe; also for milling machines, planers, shapers and grinders—tool room or mass production work. **"Turn to Turchan" to cut costs.**

WRITE US TODAY: Send a sketch and specifications of any work. Give make of machine. We'll show you how to produce it better, faster, at lower cost.

FOLLOWER MACHINE COMPANY

Oldest Manufacturer of Hydraulic Duplicating Attachments for Machine Tools

Production AND Engineering
NEWS AT A GLANCE

SLASHES DIE CASTING COSTS—Small parts producers dependent on outside sources for even the simplest and lightest castings may find it profitable to look into the latest high speed die casting machine developed by DCMT Die Casting Machine Corp., New York. The unit which employs the new principle of fast chill and high cycling speed on low cost small single impression dies, eliminates scrap loss, most secondary operations and finishing costs. It is supplied with small prefabricated die blanks in which cavities can be machined readily. Method provides tremendous savings even on production runs as low as 2000.

STUPENDOUS "DISHWASHER"—Ferrous castings weighing up to 75 tons are cleaned by a huge industrial "dishwasher" at the Beloit Works of Fairbanks, Morse & Co. Cleaning and blasting unit employed, manufactured by Hydro-Blast Corp., Chicago, is said to be among the largest in the country—cleaning castings by subjecting them to a high velocity stream of water and sand mixture. Cleaning operations are centered in a steel roofless 20 x 18-foot room which can be entered by two swing doors at both ends and one side. Work is cleaned while revolving in either direction on two 12-foot circular turntables—one at each end of the room—or on a stationary square platform in the center. Work is blasted by three swiveling water and sand ejecting nozzles which are moved vertically by individual elevators and horizontally by carriages.

MONEY-SAVING CHANGE— Change in manufacturing methods often pay big dividends. Brass gears in a water motor of a lawn sprinkler formerly were made by broaching square holes in them to fit square shaft ends which were then peened over. Now, Handy & Harman reports, the gears are brazed to round shafts in less than one minute for the whole train. The revised procedure not only eliminates field failures but also reduces production costs. Further savings are expected when a setup is tooled to braze spray nozzles to the oscillating water tube.

SIMPLIFIES FIN-TO-TUBE SOLDERING—"Threading" of copper tubes through fins and subsequent soldering in the production of heater radiators is done by following various procedures. In the plant of Tuttle & Bailey Inc., New Britain, Conn., fin sheets are dropped between steel plates in a jig. Steel points are then inserted into front ends of the tubes and solder wire is placed in the holes of the points. The tubes are then hand-started into the first plate, then forced through the other plates by an air cylinder causing the solder to be pulled through the tubes. The solder is melted by a special electric heating method that enables the operater to wash the flux from the previous unit while the next is being soldered.

SHRINKS LABOR COSTS— Labor costs are cut as much as 75 per cent and tooling simplified considerably when employing an all-purpose indexing unit in drilling, reaming, countersinking and tapping operations. A horizontal type unit developed by Snow Mfg. Co., Bellwood, Ill., provides high production through ease of changeover, setup, loading and unloading. In multihole drilling operations requiring accuracy of spacing, for example, several of the units can be tooled to allow one operator to feed three or four machines. Operator merely inserts work, starts the drilling cycle and goes on loading and unloading other machines. With a simple setup change, the units can be used in processing stampings.

ASTE EXPOSITION

Next week, April 10-14, the American Society of Tool Engineers will hold its seventh and largest show at Convention Hall in Philadelphia.

It will be attended by many of the 18,000 members of ASTE's 72 chapters covering the industrial areas of the U. S. and Canada, as well as the thousands of others who are interested in some way in the latest tooling practices.

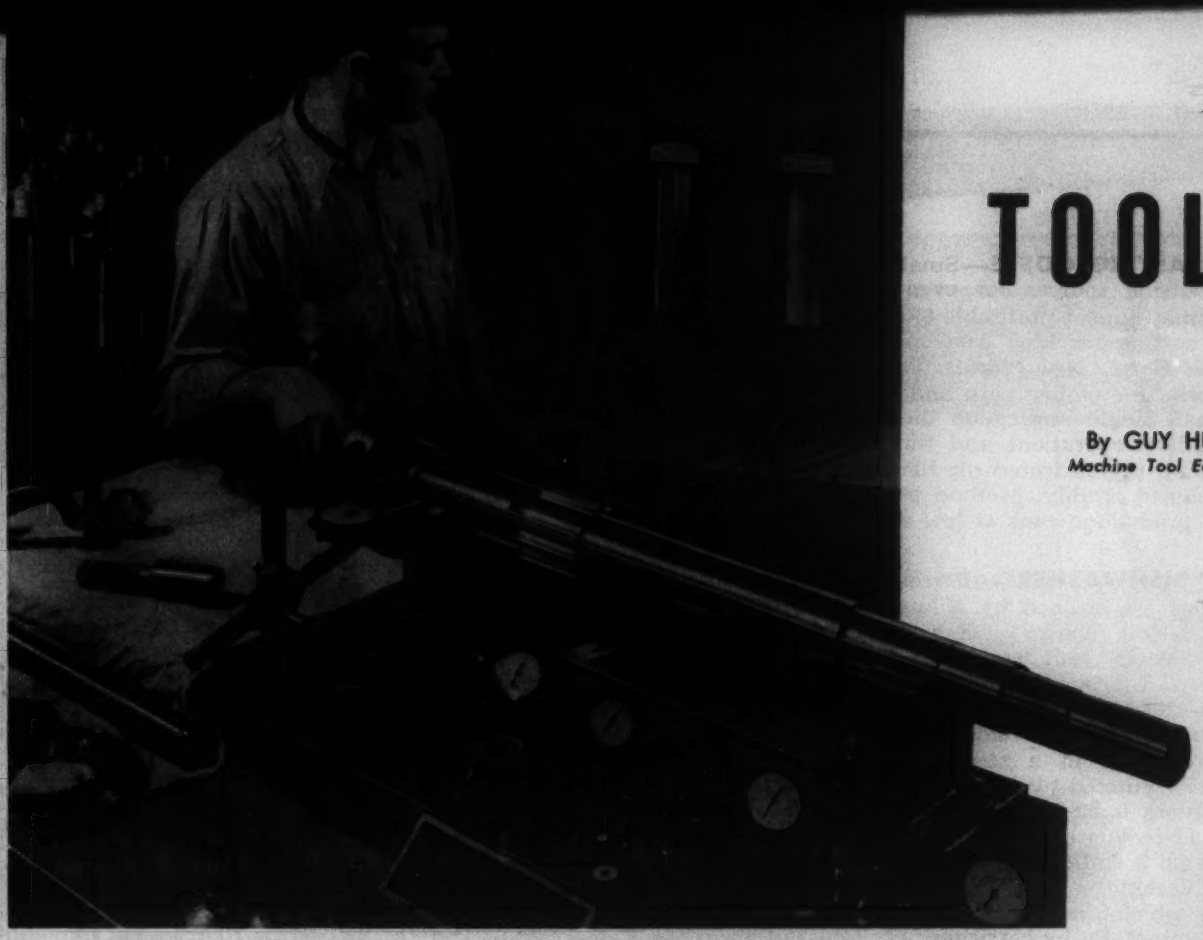
This year, the show is aptly called "The Industrial Cost-Cutting Exposition" in keeping with the pressure on management everywhere to produce more at lower costs.

This week, STEEL devotes the entire following section to giving you a "feel" of the exposition and the informative meetings which will be held in conjunction with it, plus articles of current interest.

In referring to the ASTE program on page 114 you will note that many current subjects, such as automation and cold extrusion, will be adequately covered. A high spot of the week will be an economics forum with a panel of celebrities including Dr. Edwin G. Nourse.

On the following two pages of this issue of STEEL, read Guy Hubbard's appraisal of the exposition. On pages 94-97, you will find a picture story on how Chevrolet licks costs in producing its new automatic transmission. Art Allen's article beginning on page 102 tells how Ford gets the most out of automation. By all means find out how Westinghouse evaluates tooling materials in the article beginning on page 98.

We urge you to attend the show. If you cannot, look over the list of exhibits beginning on page 116. Note the ones that interest you on one of the cards beginning on page 153. Additional information will come along without obligation.



TOOLING F

By GUY HUBBARD
Machine Tool Editor, STEEL

Heavy responsibilities rest on tool engineers in the machine tool industry. To reproduce accuracy, "master tools of industry" themselves must be of superlative accuracy. This array of gages is involved in inspection of Monarch lathe spindles

MACHINE tools and other metalworking machines—no matter how complicated—have one basic function. That function is to bring workpieces and tools into operating contact so that the work is shaped according to prearranged design and according to set limits as to size and surface quality.

No machine is "the world's best investment" until it has been tooled up to perform this basic function at maximum speed compatable with safe operation and satisfactory tool life; and with minimum loss of time and minimum waste of material. At the same time cost of tooling itself must be kept within reasonable limits and, it must be designed for operators' convenience—one of the "keys" to good labor relations—and for economical maintenance.

Obviously the tool engineering profession is playing a major role in the current struggle against high manufacturing costs. As other articles, the program and directory on the following pages demonstrate, the tool engineering front in this economic war extends far beyond mere design of cutting tools. It involves among other things; tool materials and their metallurgical treatment; it involves work handling in machines and from one machine to another; it involves work guards and other safety devices; it involves selection, application and cleaning of lubricants and coolants; it involves chip disposal; it involves "in-machine" and "after-machining" gaging and inspection; and it involves methods of assembly.

Except for special purpose machines—which often involve more tool engineering than they do machine tool engineering—there is a tendency for machine tool design to hit peaks at the time of national machine tool shows. The last was held in the fall of 1947. The next will be at some time in the fairly distant future. In the meantime, tool engineering remains in a much more fluid condition. Its progress must be given overall consideration at more frequent intervals.

Thanks to the influence and enterprise of American Society of Tool Engineers, this long has been accomplished through a continuing series of National Tool Exhibitions. Since 1946 these have been held every two years. Of these, the one at Philadelphia, April 10-14, 1950, not only will be the most complete but also most timely because of its emphasis on "cost cutting" at a moment when tool engineering is the only profession which can offer industry high hope for solid accomplishments in halting price increases in the face of a buyers' market.

With more than 320 companies participating, the 1950 ASTE Exposition is far more than a mere "tool show." Rather, it is a panorama of that tremendous industrial field called "the American system of manufacturing." While tool engineering is at the center of this panorama, its scope actually covers equipment,

G FOR COST CUTTING

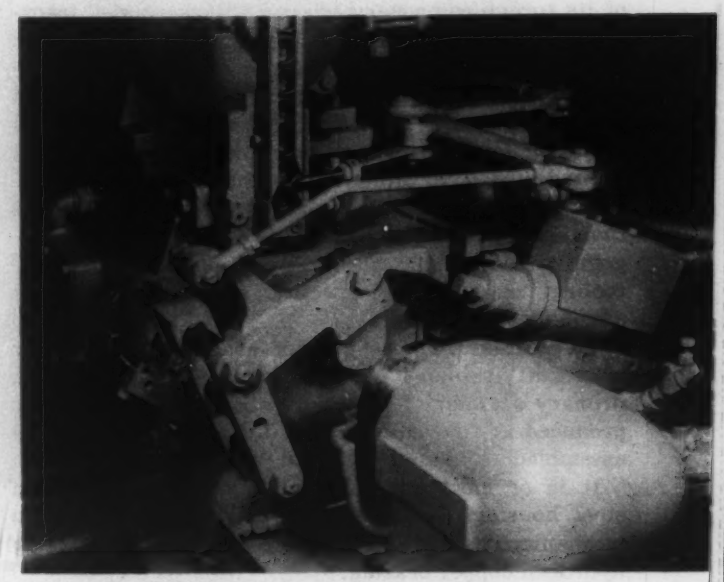
Industrialists trapped between rising costs of labor and material, and demands for better products at lower prices, will discover numerous practical and profitable "ways out" at Tool Engineers' Exposition, Philadelphia

materials and techniques involved in production of products ranging all the way from wrist watches to locomotives.

To get the most out of this great show, don't neglect the economic and technical sessions which run along with it as features of the annual meeting of ASTE. That is true particularly of the Economic Forum at Academy of Music, Monday evening, April 10. On this occasion, four topflight economists will voice their opinions, engage in debate and answer questions. Conclusions drawn from this forum can well set a pattern for the future of your business. Certainly they will help you to evaluate things you will see in the show. The same will be true of technical papers.

When a tool engineer undertakes to tool up a job, he starts with the part and "builds the tooling around it." When you attend this show, keep foremost in mind the parts you make. Look for things in the show which will contribute to faster, better and cheaper production of those parts. Somewhere in the array of exhibits those things will be demonstrated by men who can help you to apply them successfully to the solution of your "quantity, quality and cost" problems.

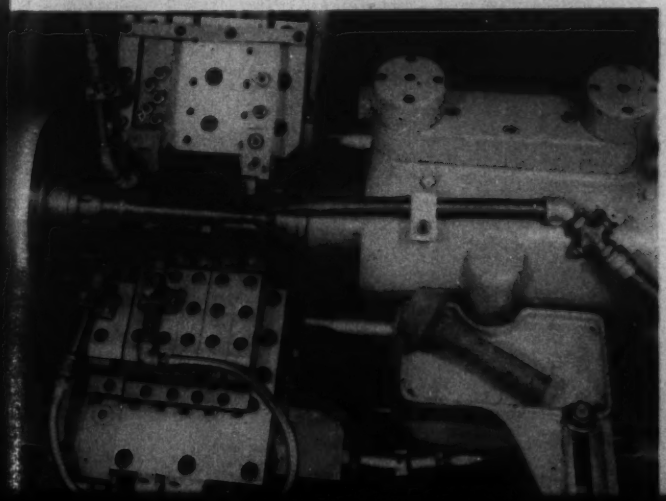
Study of directory may narrow down your search to some extent, but you still will have to wear out a lot of shoe leather in your pursuits of new ideas.



Headstock of this Bryant internal grinder is virtually hidden by attachments designed by tool engineers for automatic loading, processing and unloading of work. This is a "magazine job"

Since "longest single operation determines time per piece", tool engineers have exercised ingenuity in splitting long operations into short ones on this 8-spindle Conomatic

Tool engineering primarily is responsible for 8.5 second machining of this stem pinion in Fay automatic. Cutting is divided among nine carbide tools



CHEVROLET LICKS COSTS WITH TOOLING INGENUITY

EXTRAORDINARY engineering problems confronted Chevrolet engineers in tooling up for mass production of its torque converter hydraulic "Powerglide" transmission for 1950 models.

On the one hand, smooth and trouble-free operation of a highly organized mechanism involving high pressure flow of oil, demands exact dimensions and highly finished surfaces on cast iron and pressed metal parts designed for minimum weight.

On the other hand, there is a "price ceiling" of less than $160 on this mechanism that calls for utmost ingenuity in applying station type machines, multiple tooling, mechanized inspection and production line assembly.

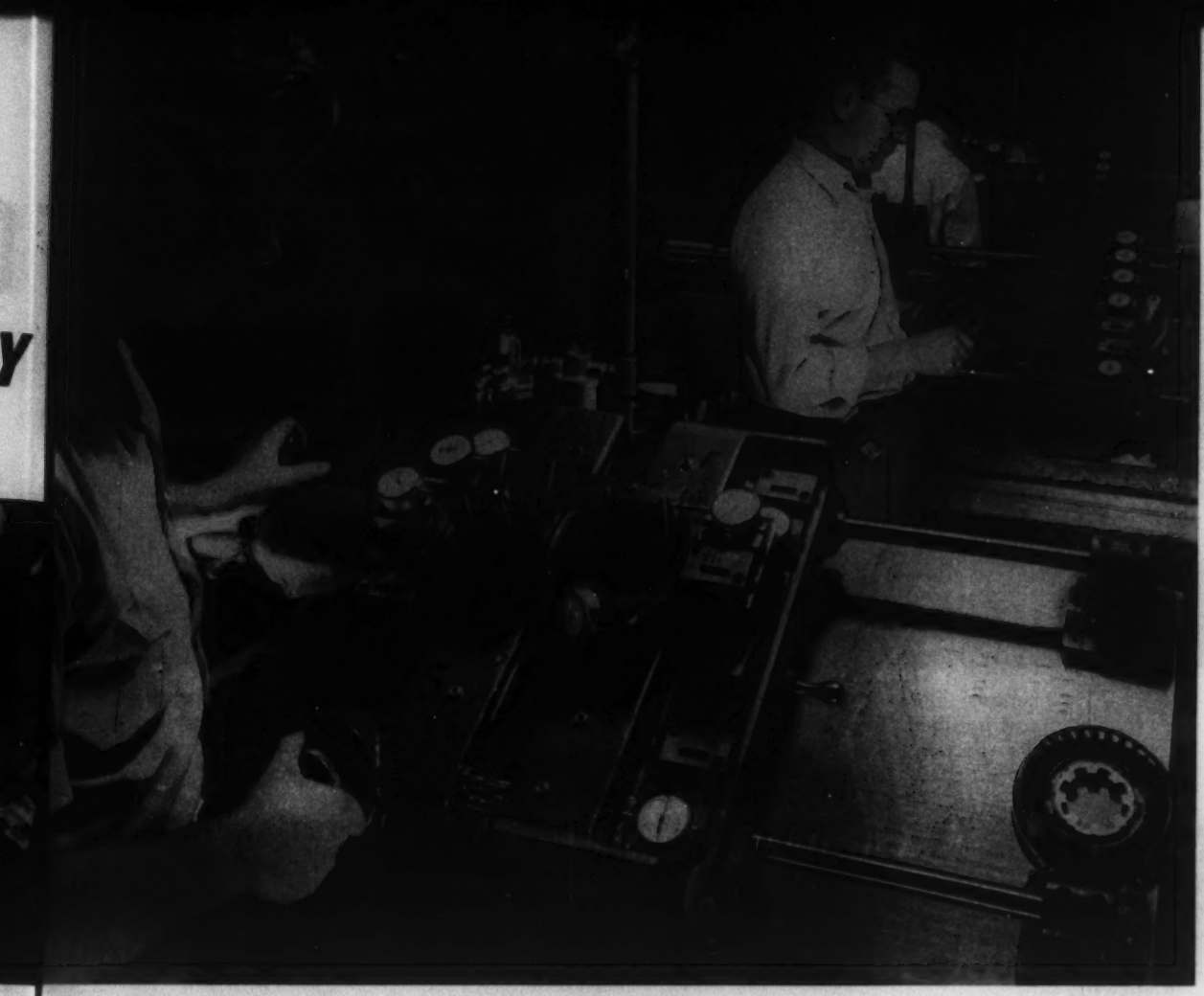
The torque converter section consists of five major elements: Primary pump, secondary pump, turbine, primary stator and secondary stator. The section is produced at Chevrolet's Flint division; machined and assembled at its new Cleveland plant.

It is of most unusual design, comprising pressed steel housings and radial vanes, locked in position mechanically first by spot welding and finally by hydrogen copper brazing.

Illustrations presented here show outstanding examples of the 350 major machine tool and 17 special-

(Above)—Running at high speed in a special purpose lathe, welded and brazed sheet steel turbine and overrun coupling assembly is "trimmed" by six tools

(Below)—Cored cast iron valve bodies are finish faced in Lapmaster machine to degree of flatness and surface quality ordinarily associated with precision gage work . . . (Center)—Location, sizing and finishing of accumulator and valve holes in cored valve body are critical operations. Sheffield Precisionnaire gage at left checks accumulator holes to 0.001-inch limits, while instrument at right checks two valve



mounted in front block and two in rear . . . (Above)—Following precision finish machining of bores, edges and peripheries, pressed metal "vane assemblies" are checked on five dimensions and for runout in special fixtures equipped with dial gages

holes to 0.00005-inch . . . (Below)—Lapped surfaces of valve bodies are tested by Brush surface analyzer. Pickup unit is at left, meter giving direct readings in microinches is at center and at right is recorder which traces microinch variations on paper tape

(Above)—Dual revolving fixtures, designed to hold cast iron bell pump housings without distortion, save time by permitting operator to load one while milling is done in the other . . . (Center)—Loading end of W. F. & John Barnes 15-station transfer machine, showing "palletized" bell housings entering "corridor" in

ly organized inspection setups at Cleveland. In the 150,000 square foot area now devoted to this activity, there is more talk and more action in terms of "split thousandths" and "microinches" than in any General Motors' production division since Chevrolet's successful venture into Pratt & Whitney aircraft engine manufacturing during the war.

Two major varieties of "raw material" enter the Cleveland plant. One consists of sand blasted gray iron castings from the Chevrolet-Saginaw foundry in Michigan. The other consists of welded and brazed "vane assemblies" produced at Flint.

In addition to cost reducing mass machining — coupled with gage-like final finishing—which is emphasized by these illustrations, still another vital element is the extreme degree of cleanliness.

No part or subassembly can enter the final assembly area unless scrupulously clean. This involves use of eight washers at various stages in the lines. In addition the assembly department is fully enclosed and supplied with filtered air under pressure to prevent infiltration of dust.

Similarity to a gage plant is further borne out by the fact that of the 350 major pieces of manufacturing equipment, almost one-third are in the class of precision machine tools. Furthermore, nearly every machine tool has some kind of inspection activity associated with it. In addition to numerous gaging and testing devices of common variety, there are 17 specially designed pieces of testing apparatus—ten in the production lines and seven in the assembly room. Also, there are eight special measuring instruments in the gear laboratory.

With all due respect to the inventors, and research laboratory people and designers who dreamed up, perfected the principles and made the drawings for this hydraulic transmission, its materialization as a commercial product can in ample measure be credited to joint efforts of tool engineers and production men.

COST-CUTTING ASTE EXPOSITION
PHILADELPHIA APR. 10-14, 1950

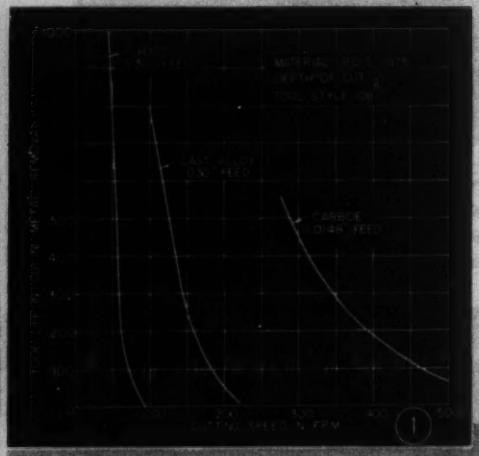
(Right)—Minimum delay in replacement of d damaged tools on 16-station Cross Transferm insured by "diagrammatic tool board" visib background. This carries full complement o duplicate tools for this transmission case job

(Below)—Typical of concentration of tooling involved in machining transmission cases, is this setup in a Cross machine wherein 29 taps operate simultaneously on a single transmission case at one setting

which single and multiple heads operating on top and sides, drill, ream, counterbore and face. There are 89 tools in all . . . (Above)—Single point tool mounted on heavy arm revolved by spindle of precision horizontal boring machine takes finish cut on flange to 0.002-inch overall limit on 14.495-inch diameter

How Westinghouse Evaluates

CUTTING TOOL

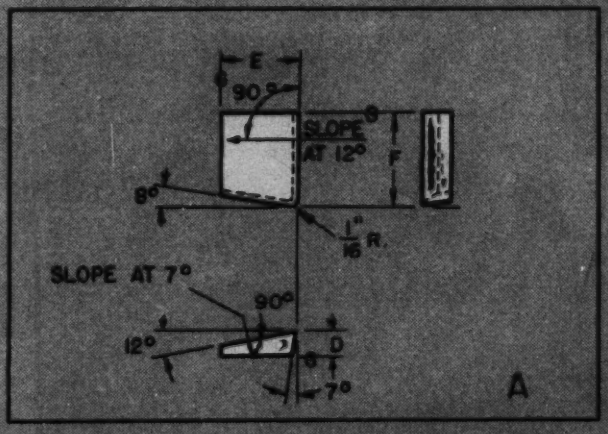


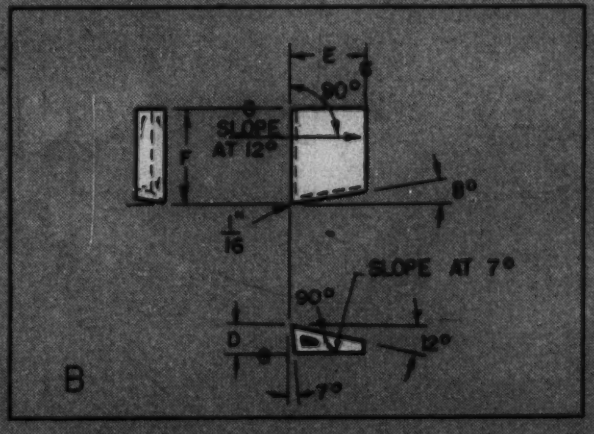
WHAT IS CAST ALLOY?

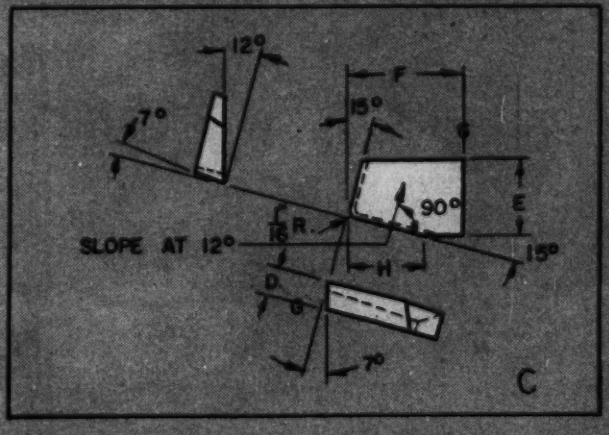
Material derives its name from the fact that it is given form and assumes its cutting properties by casting. It is not forgable, heat treatable, nor machinable except by grinding. It resembles steel in appearance, however, it is not a steel as it contains iron only as an impurity.

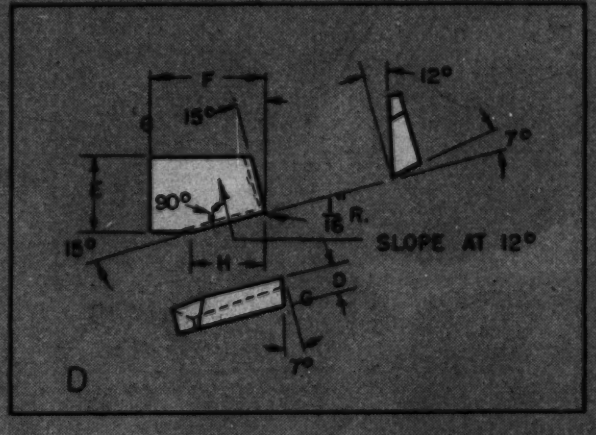
This material is principally a mixture of chromium, tungsten and cobalt, and may contain minor percentages of such elements as carbon, vanadium, manganese, tantalum, and iron. The exact nature of the resulting alloy and the composition and structure of the material is unknown.

Cast alloy's popularity as a cutting tool is due solely to the fact that it will withstand heat developed in cutting up to 1600° F. This compares with a top limit of 1100° F for high speed steel tools.









Lower machining costs effected by first checking relative efficiencies of high speed steels, cast alloys and carbides in manufacturing engineering laboratory. Cast types show up well but must be chosen carefully

MATERIALS

TESTS have disclosed that for a given tool life when machining annealed steels, cast alloys will remove metal at twice the rate of a high speed tool, and closely approach the metal removal rate of carbides. Experience of Westinghouse Electric Corp., Pittsburgh, reveals that cast alloys are most efficient when used as roughing tools where high metal removal rates are desired.

Characteristics—The cutting properties of cast alloy are determined by the severity of the chill when cast and at present cannot be improved by any known subsequent treatments. A series of tests were run by Westinghouse using tools that had been nitrided. It was evident from these tests that nitriding increases the efficiency; however, this increase was not enough to justify retreatment required.

Carburizing also improves the cutting efficiency of cast alloy tools, but only at a considerable sacrifice in toughness. Carburized cast alloy tools are very brittle and have been found to break so easily that they are not a practical cutting tool.

Tools that were chromium plated showed an increase in efficiency, but the increase was not large enough to justify the cost of replating after each grind. Plating, like nitriding, gives only a skin effect and is ground away whenever the tool is resharpened.

Fig. 1—Tool life curve for three cutting materials within their usual cutting speed range

Fig. 2—Types of cast alloy tips for single point cutting tools. These tips are precision cast, resulting in savings in first grinding of tools

Fig. 3—Relationship derived from Fig. 1 in terms of amount of metal removed (A) and relative cutting time values (B)

Cast alloy is not as tough as high speed steel, but somewhat more so than carbides. It has many of the desirable properties of high speed steel and is found to closely approach the efficiency of a carbide tool.

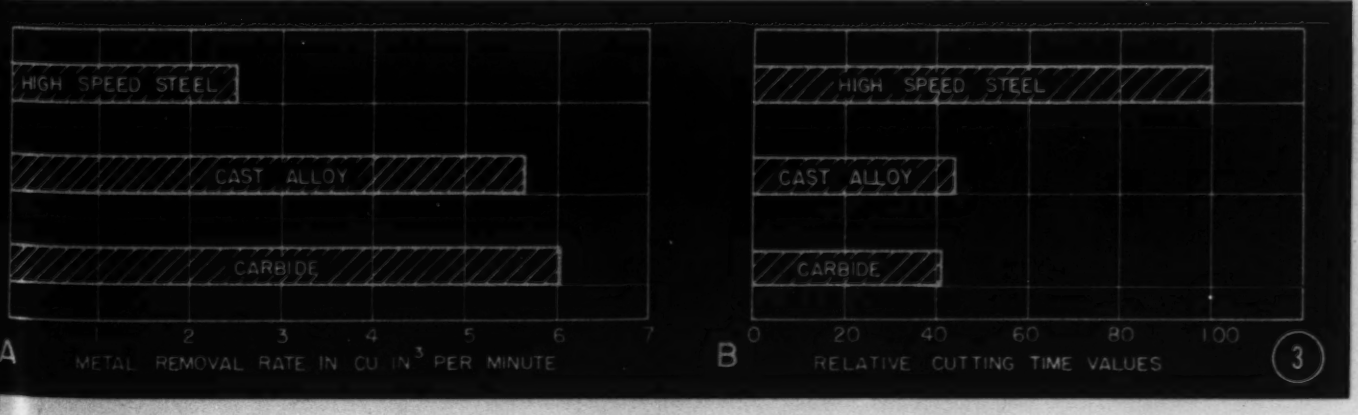
Applications—Cast alloys for cutting applications are essentially roughing tools and should be used when high metal removal rates are desired. There are certain drawbacks to its use as a finishing tool. Due to granular nature and minute voids usually present in a cast material, a perfect cutting edge cannot be obtained.

It also has poor resistance to abrasion as its hardness is lower than any of the other cutting materials. Where the feed is fine and the contact with the work is unusually lengthy, the tool will wear rapidly, making it difficult to keep a uniform size.

Experience has shown that on interrupted cuts a 20-degree negative back rake and a 12-degree negative side rake permit cast alloy tools to be used at high speeds with nearly normal tool life. All grades of cast alloy tools ground with the standard grind failed almost instantly on severe interrupted cuts in steel in excess of 60 to 75 surface feet per minute.

Relative Tests—Tests were carried out by Thomas Badger in the headquarters manufacturing engineering laboratory of the company to determine the exact ratio of relative cutting efficiency between high speed steel, cast alloy, and carbide cutting materials. Cutting tool grades were used which in previous tests had proven to be the best in their respective classes. The results of these tests were used in the development of Figs. 1 and 3.

Fig. 1 illustrates a tool life curve for each of the three cutting materials within their usual cutting speed



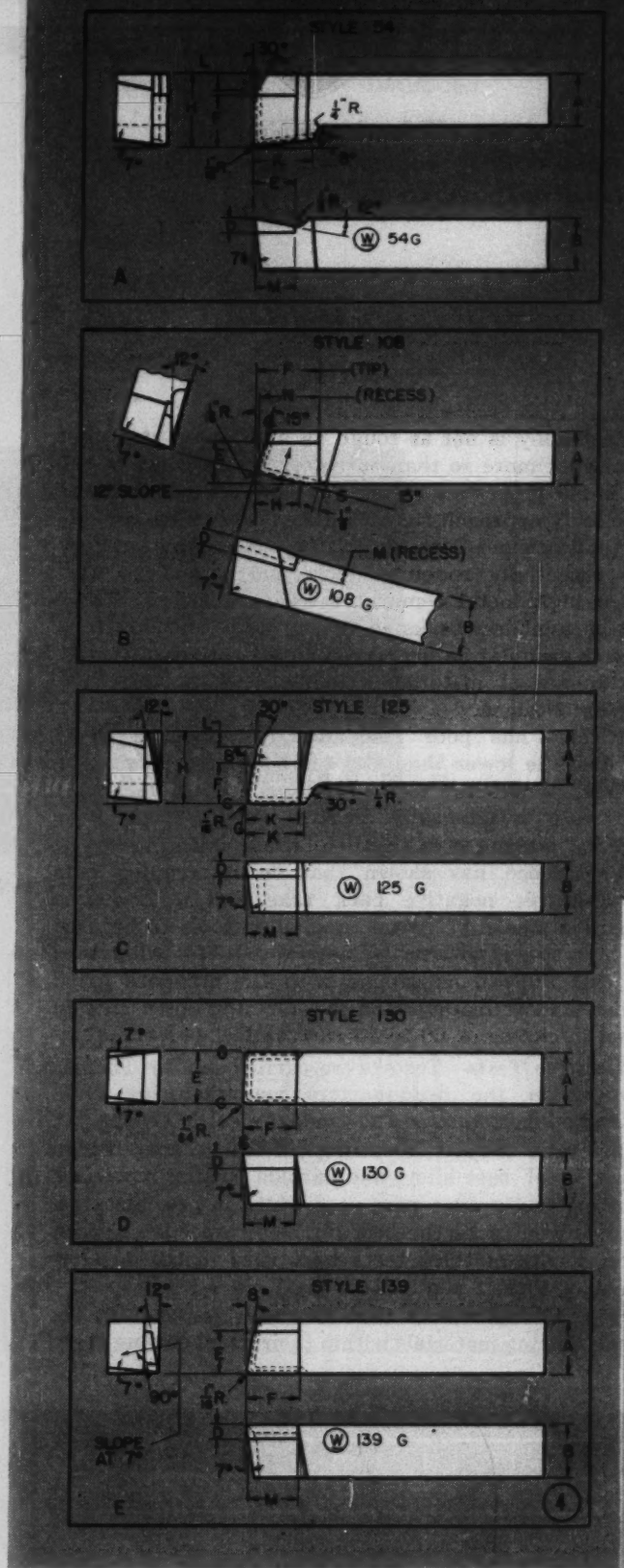


Fig. 4—These types of general purpose single point tools may be made from the precision cast tip designs. Included are the most popular tool styles and shank sizes used in Westinghouse plants

range. It will be noted that the depth of cut and feed is the same for both high speed steel and cast alloy. Since the speed for cast alloy is double that of high speed steel, cast alloy tools will remove metal twice as fast as high speed steel for a given tool life.

In the case of cast alloy and carbide, we find the cutting speed for carbide more than double that possible for cast alloy, but the feed with carbide is 0.0148-inch compared to 0.030-inch for cast alloy. As a result, the actual metal removal rate of carbide is little more than that of cast alloy for a given tool life. The feed of 0.0148-inch for carbide proved to be the optimum feed for this type of material when tool life is taken into consideration.

Fig. 3 shows the relationship as derived from Fig. 1 in terms of amount of metal removed (A) and relative cutting time values (B). From this graph it is apparent that the actual efficiency of a cast alloy tool closely approaches that of a carbide tool.

In the comparative tests selection of carbide grade was made from the Westinghouse grade selection chart. When a precise selection of carbide grade can be made for a given application rather than using the selection chart, an increase of 50 per cent in metal removal can be expected.

Alloy Grades Differ—Exhaustive tests were made in 1946 and 1947 to determine the better grades of cast alloy for cutting steel. Since that time additional tests have been made on each new grade of cast alloy as it appeared on the market. Similar tests were conducted in 1949 on cast iron; in these tests it was

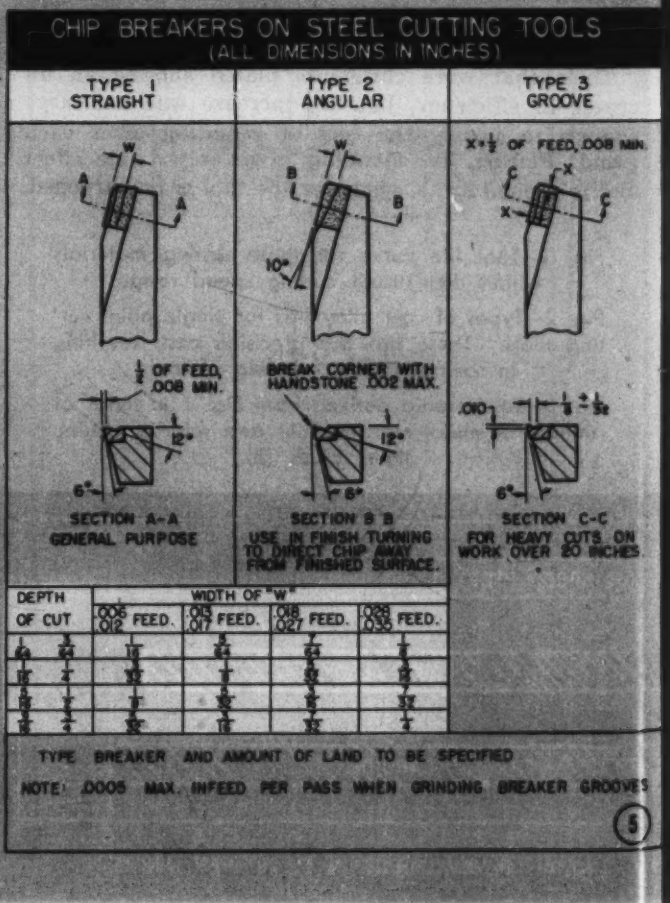

CHIP BREAKERS ON STEEL CUTTING TOOLS
(ALL DIMENSIONS IN INCHES)
TYPE 1 STRAIGHT
TYPE 2 ANGULAR
TYPE 3 GROOVE
SECTION A-A GENERAL PURPOSE
SECTION B B USE IN FINISH TURNING TO DIRECT CHIP AWAY FROM FINISHED SURFACE.
SECTION C-C FOR HEAVY CUTS ON WORK OVER 20 INCHES
BREAK CORNER WITH HANDSTONE .002 MAX.
DEPTH OF CUT
WIDTH OF "W"
.006 .012 FEED.
.013 .017 FEED.
.018 .027 FEED.
.028 .035 FEED.
TYPE BREAKER AND AMOUNT OF LAND TO BE SPECIFIED
NOTE: .0005 MAX. INFEED PER PASS WHEN GRINDING BREAKER GROOVES

Fig. 5—Types of chip breakers on steel cutting tools

found that the same grades of cast alloy which proved best for steel were also superior for cast iron.

Considerable care must be exercised in purchasing cast alloy tool materials. Tests have revealed that there is a variation of several hundred per cent in the efficiency of the grades available on the market.

Tool and Tip Design—As an aid in making up cast alloy tipped tools a series of designs were made by the tool standards section of the headquarters manufacturing engineering department. These designs, shown in Fig. 2, utilize the fact that the tips can be precision cast—resulting in substantial savings when grinding tools the first time.

Fig. 4 illustrates the general purpose single point tools which may be made from the precision cast tip designs. The most popular tool styles and shank sizes commonly used in Westinghouse plants are shown.

It should be noted that shank length and dimensions designated as A and B, those dimensions referring to tip size D, E and F, and other dimensions H, K, L, M and N, vary with the size of tool in a particular style. Number followed by letter on tool shank is tool style and size within that style, referring to master Westinghouse charts.

Style 108 in Fig. 4 shows the principles of good cast alloy tool design for either a solid or tipped tool. Several necessary rules for good tool design are: Keep the clearance angles to a minimum—6 degree side and end clearance has been found best; the end cutting clearance should be between 8 and 10 degrees, undercutting of any portion of the cutting edge should be avoided; the best possible support should be provided for the cutting edge by either a proper tool holder or an adequate shank size.

Chill Affects Cutting—Since the cutting properties of cast alloy are determined by the severity of the chill in casting, different cross sections will have varying cutting efficiencies. In general, the cutting efficiency is known to decrease as the section size increases.

To prove this effect, a test was made using ⅜-inch square, ⅝-inch square and 1½-inch square tools tipped with a 5/16-inch thick tip. The results of this test follow:

Section Size of Tool Inch	Metal Removed Cubic Inches	Tool Life Minutes
5/16	64.9	10.6
3/8	62.9	10.3
5/8	56.0	9.15

All tools were given the same support, so that the results were not affected by the deflection of tools. From these results it is evident that cast alloy tools of the smallest possible section size should be used. If a tool over ¾-inch section size is required, it is best to use a tipped tool.

To overcome the difficulties usually encountered in chip disposal, the chip breaker shown in Fig. 5 is recommended without modification for cast alloy tools. The chip curler groove commonly ground by hand in high speed tools can be used on cast alloy tools, but only at a serious sacrifice of tool life.

Grinding and Lapping—Cast alloys can be ground with either aluminum oxide or silicon carbide grinding wheels. A grinding setup similar to that required for carbides is most desirable as accurate grinding will give the best results. Tools ground on a shop pedestal grinder using the periphery of the wheel are almost always undercut or ground with excessive clearances.

Sixty-grit or finer aluminum oxide or silicon carbide wheel should be used to grind chip breaker grooves. Surfaces of chip breaker groove should be hand-honed or diamond-lapped to obtain best results.

For many years it was the general belief that improving the surface finish of a cutting tool was beneficial to the life of the tool only where fine feeds were applied. The thinking behind this supposition was that under extremely heavy cuts the surface finish of the cutting edge was completely removed by the initial impact of the heavy cutting pressures, and therefore a highly refined surface finish was of no advantage.

To test the effect of surface finish on cutting tools under heavy feeds a number of lathe tools have been tested. For comparison, the tools of one test group were carefully ground on a shop pedestal grinder using a freshly dressed wheel. The tools of a second test group were ground on a Buraway grinder and lapped on a 220-grit diamond wheel. All tools were high speed steel and were of a single lot which had been previously tested for uniformity of hardness.

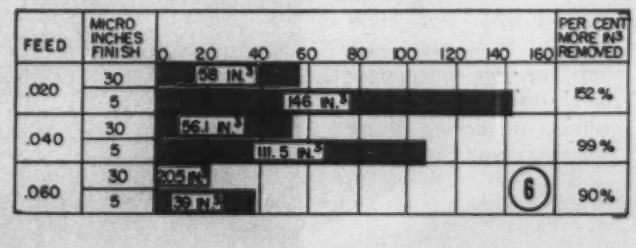
The resulting finish on the first group of tools was approximately 30 microinches and on the second approximately 5 microinches. Speed used in the test was 136 surface feet per minute; depth of cut, ⅛-inch; work material was 0.45 carbon forging, heat treated to a Brinell hardness of 210.

The results of the test are shown in Fig. 6. Since tool life is measured by the cubic inches of metal removed, it can be seen that even with the heavy feed of 0.060-inch, tool life was increased 90 per cent by improving the surface finish from 30 microinches to 5 microinches.

Use of Coolants—Coolants will increase tool life from 100 to 400 per cent over dry cutting at the same cutting speed. For a given tool life, an adequate supply of coolant will permit an increase in cutting speed of 15 per cent over dry cutting. This applies only to those materials where a coolant is normally used.

Cast alloys are more subject to heat cracks than high speed steel, but somewhat less so than carbides. For this reason every effort should be made to avoid intermittent application of the coolant when cutting to eliminate tool cracks due to heat shock.

Fig. 6—Comparison of amount of metal removed by tools having 5 and 30 microinch finishes. At all feeds shown the amount removed is far greater for the smoother finished tool



"AUTOMATION"

—A Magic Word Which May Spell Lower Production Costs for You

By A. H. ALLEN
Detroit Editor, STEEL

Fig. 1—(above)—Engineers study wooden model of automation device for loading spring leaf onto conveyor after it passes through draw furnace

Fig. 2—(right)—Iron hand operated from press jack shaft removes inner door panel after drawing operation, depositing it on turnover type conveyor

Automation, credited to Del S. Harder of Ford Motor Co., is defined as the automatic movement of parts between processing operations, synchronizing such movement with the production of the machine line. It is one of the most intriguing subjects concerned with tooling today and headlines the ASTE program at Philadelphia, April 10-14. Here's how Ford saves up to 20 per cent, permitting equipment write-offs in 3 to 12 months

TECHNIQUE of automation is becoming recognized throughout the metalworking industry as the legitimate offspring of the marriage of mechanized materials handling to the postwar superincentive of cost-cutting. It is entirely fitting that automation should occupy such a prominent spot on the agenda of the American Society of Tool Engineers' cost-cutting exposition in Philadelphia next week, for it is essentially specialized tooling designed to effect cost savings.

Actually, there is nothing new about the principle except the term and its numerous latter-day refinements. Credit is generally given to Del S. Harder, Ford Motor Co., vice president-manufacturing, for originating the expression, dating back to 1940. He has the reputation of tossing out frequent tough nuts for his staff to crack, on the principle that these "brain busters" will stimulate original thinking and out of this thinking will come new, often unconventional and yet profitable methods or devices. So it was with automation, which might be defined as the automatic movement of parts between processing operations, synchronizing such movement with the production rhythm of the machine line.

Automation "Task Force"—Mindful of his early experience at Fisher Body where mechanical devices for extraction of formed parts from stamping presses had been in use as far back as 1940, Mr. Harder suggested organizing an automation department at Ford to concentrate on pressed steel operations. A group of engineers and draftsmen set at the task, dreaming up new ways to load, unload and transfer steel parts from one press to the next. They relocated many of the presses in the vast Ford pressed steel plant, opening up their spacing so conveyors, slides, chutes, rollover cradles and other special equipment could be installed. Ford automation engineers designed and built "iron hands," experimenting with various methods of actuating the swinging arm and the jaws which grab the part from the dies and pull it from the press onto a conveyor before the press ram has reached the top of its return stroke. They also bought some of the "iron hands" developed by Harry Sahlin who had many years of experience with Fisher Body and later E. W. Bliss.

Economies Range Up to 20 Per Cent—But "iron hands" proved only a small part of overall automation in pressed steel. By the end of two years, the 50-man automation crew had designed and built well over 400 special devices at a cost of close to $1.5

Fig. 3—(below)—Closeup of conveyor device for turning over inner door panels as they move from trimming press to next operation. Striped stamping is a "tracer" piece marked so it can be easily followed and identified in photographs of operational sequence . . . Fig. 4—(right)—Another variation of the iron hand releasing fuel tank half after removing it from draw dies.

million, and their installation brought economies ranging up to 20 per cent in some cases. That is not much of an investment when it is stacked alongside perhaps $100 million which will be spent in the overall tooling of a single model series of the Ford-Mercury-Lincoln family, but in each case the automation device had to prove itself out economically, that is, produce enough saving in piece cost to write off the equipment investment in 3 to 12 months.

What does automation equipment do? Reduced to fundamentals, it may lift, lower, push, pull, turn or roll-over parts between operations, with the use of either power or gravity. There are combinations of these functions, and there are corollary operations such as application of draw compound, removal of scrap, sorting, counting and inspection. You may say these are nothing more than different types of materials handling and probably you would be technically correct. But, as automotive production and plant layout men see it —and the great bulk of automation thus far has been in the auto industry—it is more a specialized type of material handling, actually more in the nature of tooling than conveying. Much of it is charged of as tooling, just as are dies, jigs and fixtures.

Dividing Line Vague—Its principal applications, naturally, are in high-production repetitive manufacture, and preferably in plants specifically laid out with automation in view. Thus it has little value to the jobbing shop, or in places where frequent changes must be made in setups. Just where the dividing line is between effective and useless automation at this stage is vague—perhaps there is no line. Each prospective application must be studied, analyzed carefully by experienced engineers. There are not many as yet who have made a career of automation. G. G. Murie and W. J. Bedson are two of Ford's top automation experts and they profess to having frequently heard their ideas called Rube Goldbergish. Still, their installations have paid off, and they have "only begun to think up new stuff." The Ford automation department, originally a section of production engineering, now is a part of the plant layout organization.

What's the score on automation? There are the plus values, as well as the negative side. It stacks up about like this:

Plus Side—1. *Cost reduction:* This is the most important element, and requires most intensive study. Few seconds trimmed from man-hour requirements of a certain part will add up importantly when production schedules may call for 5000-10,000 a day. Principal cost reduction comes from relieving manual effort, conversion of manpower to horsepower. This does not mean complete elimination of manpower but elimination of drudgery to the end that displaced men can move to more important and higher-paying jobs.

2. *Speed*: Naturally tied in with cost reduction, since automatic transfer of parts between operations permits using machines to more nearly their designed capacity. With high cost of industrial equipment, its maximum utility is imperative. Synchronization and timing of integrated lines of machine equipment are the order of the day and the only solution to the variability of human effort, willful or otherwise, appears to rest with automation.

3. *Safety*: Wherever there is an operator at a machine or between machines there is a safety hazard, no matter what special precautions are taken for his protection. By elimination of some operators and by transfer of responsibilty from hands to minds of others, accident frequency and severity are definitely lessened.

4. *Quality*: Where precison handling of parts between operations can be established by mechanical means, it has been proved that damage to such parts is reduced, resulting in fewer rejects and less scrap.

5. *Reduced manual effort*: Automation is not aimed solely at elimination of manpower, frequently doing nothing more than lightening the physical exertion of operators. Also, in cases where heat or cold may be factors, automation equipment will function uninterruptedly, whereas the effect on individuals might throw out production timing.

Minus Side—1. *Cost of maintenance*: This is the biggest problem confronting automation engineers. Because the mechanisms involved are of precision type, usually involving limit switches, and accompanying electrical connections, air or hydraulic systems and often intricate mechanical linkages of moving arms, levers, etc., any breakdown requires a skilled crew which must get on the job in a hurry and return the equipment to operation without delay. Particularly is this true because one slight break in automation equipment between, say, two operations, will shut down an entire line since there is usually no float of parts between operations. Some plants, Ford for example, station a trained maintenance man in every department where automation is used, whose sole responsibility is to watch the various handling devices and adjust them if they go out of kilter. Meanwhile engineers are attacking the maintenance problem by working constantly to simplify the equipment.

2. *Cost of engineering*: Automation devices, because most of them are specially designed and specially built, are usually quite expensive. They require long hours on the drafting board and in the construction phase. Frequently it is the practice to build up a wood model, either full size or on reduced scale, to test out the principle involved. Eventually these models are turned over to a company

Fig. 5—Automation device picks up a hot coil spring and lifts it into an oil quenching machine

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trade school for training automation maintenance crews. Machinery to which automation devices are to be attached may require special design to accommodate the handling systems. An important factor is scrap removal which is accomplished manually in a conventional line of equipment but requires special consideration where automation is to be applied. In press work, it is possible to design dies so that scrap will fall away by gravity into chutes which carry it to disposal conveyors or boxes.

3. *Cost of installation*: If extensive reworking or relocation of production equipment is necessary to permit adaptation of automation equipment, costs naturally rise. Thus, when "iron hand" devices were installed in the Ford pressed steel plant, it was necessary to move and relocate about half the entire battery of presses so there would be sufficient space between them to allow the handling devices to be installed for satisfactory operation. There are approximately 100 "iron hands" now installed in the plant, of different types and sizes and handling a variety of pressed steel parts. Cost of the devices, before installation, will run from $1800 to $3100 each.

4. *Limited adaptability*: Space available between succeeding stations is a production line, clearance between equipment and the plant structure, together with the characteristics (size and shape) of the part to be handled, are governing factors in automation. Rapid strides are being made in extending adaptability, as more becomes known about the technique, and all new plant projects are studied carefully in the layout stage, so that the maximum degree of automation can be realized. The problem becomes more complicated in adapting automation to older production lines. As mentioned before the first applications studied at Ford were in the pressed steel division, and special devices are now used to handle door panels, wheel housings, quarter panels, roof panels, floor pans, fuel tanks and frames. Recently the automation department has been concentrating on the analysis of machined parts production and future applications of their methods will be more in this direction.

One of the most notable adaptations of full automation in machined parts is that developed for cast iron valve guide bushings. Production runs 100,000 per two 8-hour shifts and operations include drilling, reaming, turning, facing, grooving, boring, finish grinding, inspection and phosphate coating—all carried out automatically, including loading and unloading from each operation. Automatic inspection devices will throw out bushings as little as 0.0002-inch oversize on the outside diameter.

5. *Limited flexibility*: There is virtually no standardization as yet in automation devices, although Harry Sahlin says he is attempting to standardize on three sizes of iron hands—small, medium and large—for installation on different types of presses. Thus far, he has built about 175 of these hands, with about 25 different plants using them. Ford automation experts estimate that possibly 50 per cent of their devices might be adaptable to other installations, with some modificatons. In general, however, special handling devices are engineered to the job and must undergo considerable alteration for other operations.

Maximum Automation — The new Hamburg, N. Y., pressed steel plant which Ford is now building and equipping for operation by late summer was planned for maximum use of automation equipment. On a typical press line for instrument panels, flow of material will be about like this:

Coils of strip steel will be placed in uncoilers feeding the blanking press. Blanks will be lifted from the lower die by means of suction cups on the upper die, dropped on a special "hayrack" device linked mechanically to the press. This will transfer the blank to a power conveyor or stacker. Then the pieces will be placed on an automatic feeder or loader which moves them into the draw press. Use of this "preloading" technique permits an operator to place a blank from a stack onto the feeder while the press is completing its cycle on the previous piece, thus relieving demand on the operator to spot a blank in the press without interrupting its normal cycle. As the blank moves into the draw press, automatic spray guns are actuated to apply drawing compound to the surface of the blank.

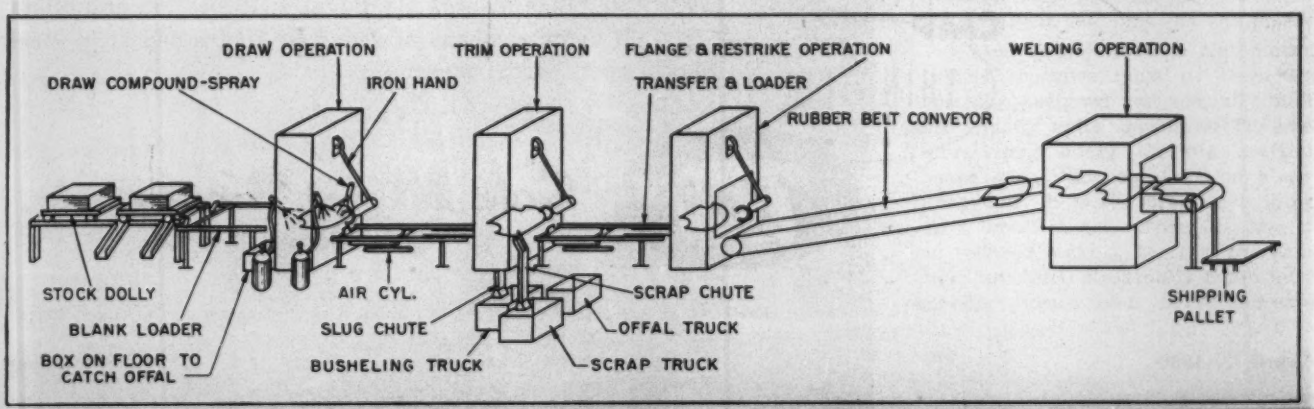
Parts are removed from the draw press by iron-hand equipment controlled mechanically from the movement of the press ram. The hand deposits the piece on a power conveyor with chains and dogs to move it ahead to the trim press. Limit switches control starting and stopping of this conveyor. Trim presses are provided with specially designed dies to allow scrap to fall down chutes to the basement level where it is deposited in buggies. Each buggy carries enough material to make a single bale, and they can be coupled into trains for removal to the baler by power truck.

Trimmings Separated — At some trimming stations, the resulting scrap is termed offal, and can be used as blanks for smaller stampings. Here the chutes are arranged to deposit the trimmings into specially painted buggies which are kept separate from those going to the baler.

The Hamburg plant will produce 42 per cent of the Ford pressed steel requirements when it reaches full operation, and will boast dozens of press lines, for large and small stampings, all of which will be set up for the latest automation ideas.

The small or medium-size producer of stampings, whether in jobbing or production lots, should take a careful look before he wades into automation as a means of reducing costs. Any proposal must be the work of trained engineers, and the most exacting analysis of costs and expected results should be made. Where frequent tool changes or die setups are

Fig. 6—Typical schematic proposal layout in perspective of automation line for drawing, trimming, flanging and welding operations



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called for, automation may be just in the way. Perhaps it will be found that some simple form of press unloading device is the extent to which automation is justified. Where the question of loading comes up there will be problems because loading usually requires accurate spotting of blanks in the press.

There are, of course, dozens of different types of press-feeding equipment which have been in use for many years and which were never considered particularly as automation. They include roll, grip, dial, magazine, transfer, indexing, gravity chute, hopper and table feeds. Most are best adapted to press work on smaller sizes of parts, or for secondary operations, although roll and grip feeds are widely used in production of larger automotive stampings.

Some Supervision Necessary — A note of caution with respect to any type of automation equipment or press feeding device: It is after all automatic and mechanical, usually adjusted to precision limits. It does not have the human ability to recognize defects in material or to know when the machine to which it is attached goes out of adjustment. Hence it will continue to function and the result may be defective steel passing through the entire production line, only to require scrapping at the end. Thus, the best automation equipment must have a degree of human supervision, if only visual. At the same time, the fact that the amount of manual effort of operators is lessened and total number of operators usually reduced, makes its consideration important.

Looking to the future, automation engineers at Ford are studying the development of automatic sheet depilers, that is, some means of removing one sheet at a time from a stack and depositing it in a press. There are problems to be licked, not the least of which is the occasional crimping of sheet edges.

Air Vs Hydraulics—Another thing, they are weighing the relative advantages of air versus hydraulics in the control of automation equipment. While air pressure is usually more readily available in industrial plants, it often varies considerably due to undiscovered leaks, and furthermore does not provide the degree of precision in control that is possible with hydraulic systems, particularly in intermittent types of operation.

A further proposal now being analyzed is the redesign of the iron-hand equipment so that its main cylinder would be actuated by a "slave cylinder" mounted on the press and controlled by motion of the press slide.

Much remains to be accomplished with automation with respect to transfer of smaller machined parts from one operation to the next. Ford has installed systems to handle such pieces as pushrods, pistons, wrist pins, valve guide bushings, valves, generator pole pieces and shafts. Notable progress also has been made at the company's Mound Road plant in handling rear axle housings from the original welded steel tube section on through swaging, slotting, flattening, upsetting, trimming, welding and straightening operations. It is estimated that automation of this department has permitted a saving of 60-70 per cent in manpower and 75 per cent in floor space over what would have been required by conventional techniques.

Earliest Efforts—One of the earliest automation efforts was in the handling of coil springs through the manufacturing sequence at Ford's Hamilton, O., plant, now being transferred to Monroe, Mich., and expanded. Special loading devices were engineered to handle springs from the coiler to quenching machine, from conveyor to draw furnace, and from a chain conveyor to shotblast tables.

A recent automation proposal, now being analyzed, relates to the handling of V-8 cylinder block castings through grinding wheel stations where the ends of the blocks and other surfaces to be machined are rough ground. At present two batteries of grinding wheels are set up for the job, with the blocks transferred from overhead conveyors to special fixtures which move the blocks past the wheels, the entire setup being hooded for exhausting the grinding dust. After the first battery of wheels, the blocks are picked up again by hoist, transferred to another overhead conveyor, moved up one floor to a second grinding unit, where they are taken off the conveyor and put in fixtures again for final grinding operations.

It is figured the entire operation might be combined into a single unit, at a cost of around $56,000, with the saving of 16 men on two shifts, or the equivalent of $48,000 annually, by the provision of suitable loading devices and workholding fixtures mounted on conveyors. On this roughly calculated basis, the new installation would pay for itself in a little over a year, not figuring the saving in floor space and power consumption.

It might be argued: Why was not the grinding operation set up that way in the first place? The answer, of course, is that the entire foundry has been functioning for many years, during which time changes in processing equipment and engine design have been frequent. In the course of such evolution, the present two-unit grinding arrangement seemed to be the most reasonable layout, on the basis of equipment and space available. There must always be some compromise on this score, which is one reason why automation is more readily adapted to a completely new plant when in the planning stage.

Spokesman for a leading press builder states his company's role in automation is generally confined to automatic press equipment—feeds, coil cradles, roll straighteners, scrap cutters and the like. However, in some cases, other material handling devices such as chutes, tables or special conveyor systems are supplied to order. Accelerated use of automatic production machinery has been coincident with spiraling costs of labor and material, and press builders find this reflected in an increasing number of inquiries and orders for presses with these semiautomatic or full automatic accessories.

Fig. 7—Automatic sheet feeder or loader moves sheet into draw press

COST-CUTTING ASTE EXPOSITION

PHILADELPHIA APR. 10-14, 1950

PRACTICAL IDEAS ON COST CUTTING

Check these helpful suggestions on ways to lower your costs and increase output

Fast, Easy on Operators

ANSWER to how to eliminate noisy and costly work operations in farm implement plants — the type that cause high labor turnovers and high percentage of rejects—is supplied by a grinder engineered by the Machine Tool Division, Charles H. Besly & Co. Beloit, Wis. The unit employs two single spindle grinder heads progressively stationed and mounted on welded steel columns attached to the tub of the grinder and also resting on the floor. It bevels and serrates hardened ledger plates in a single operation at a rate of 32 finished sections per minute. About 15,000 finished sections can be serrated in 8 hours. The first head with its vertical spindle performs the beveling operation, and the second head working on a horizontal spindle does the serrating with an abrasive wheel which grinds on its periphery.

Press Brake Saves 30%

D. M. Lippi of the A. R. Wood Mfg. Co., Luverne, Minn., reports that this company is saving 30 per cent in an operation on a large press brake. "We used to pierce some large pieces and then set them down and change dies and form them on the second operation," says Mr. Lippi. "Now we have double deck dies so that we pierce on the first operation and then raise the piece to the upper section of the die where it is formed. This does away with one handling and has cut our costs about 30 per cent."

Handles Ton of Sheets a Minute

The Tiffin Art Metal Co., Tiffin, O., unloads a ton of steel sheets a minute at a considerable saving in manpower. According to J. P. Speck, manager, "All galvanized sheets are delivered in open-top trucks in 2½ ton lifts. The trucks back into a dock in the building, sheets unloaded by overhead crane and stored down through the center of the building. When needed, a lift is placed on a four-wheel truck and pulled over to the machines. We use about 5000 tons of galvanized sheets per year and this has meant a saving of about 20 men in our plant for handling purposes. We unload a 20-ton load in 20 minutes."

Die Cast Knobs Save $6000

"One of our more noticeable savings has been in using die cast knobs instead of machined knobs," reports Zinon C. Possis, engineer, Shopmaster Inc., Minneapolis. "On 2½-inch knobs alone, we have effected a yearly saving of over $6000.

"We also have reduced the cost of our 4-inch handwheel 50 per cent by fabricating it from punch press and automatic screw machine parts, instead of using a die cast handwheel as before. Besides a substantial cost saving, our new handwheel has much better eye appeal and is functionally better.

"In abandoning a die casting in one cost-saving item and adopting it in another, the elements of size and material, of course, enter into the design problem. Our answers have proven right from a manufacturing cost angle."

Axle Ends Turned Simultaneously

Tooling setup developed by Consolidated Machine Tool Corp., Rochester, N. Y., for lathe turning bare railroad axles or journals of mounted wheel sets is reported to provide greater quality as well as higher production. It enables both axle ends to be turned simultaneously with the use of a single-point carbide tool in each carriage. Instead of cutting the ¾-inch fillet at the end of the journal with a form tool—as in a former procedure—it is generated by the same tool that does the straight turning. This is done by means of a swivelling mount that also makes possible smooth blending of straight and radius cuts. The journal and fillet are then rolled in the lathe by opposed rollers. To prevent marring, and so expedite loading and unloading, work is driven from the ends by friction drives.

Saves on Pipe Purchases

"We saved $1100 in the purchase price on 77 tons of standard pipe by buying random lengths not less than 22 feet 3 inches long, instead of the cut lengths previously orederd," reports D. N. Shuler, vice president in charge of purchases, the Jackson Mfg. Co. Inc., Harrisburg, Pa. "Our cutting cost is about one-third of the above figure."

Spray Painting with Steam

"Spray painting with the use of steam instead of compressed air is very, very new," Bradley C. Higgins, vice president, Livingstone Engineering Co., Worcester, Mass., reports. "It will save," he says, "the number of coats and thinner ordinarily required by other spraying methods." The superheated steam used in the procedure he states, leaves a smooth thick surface minimizing both wastage and drying time.

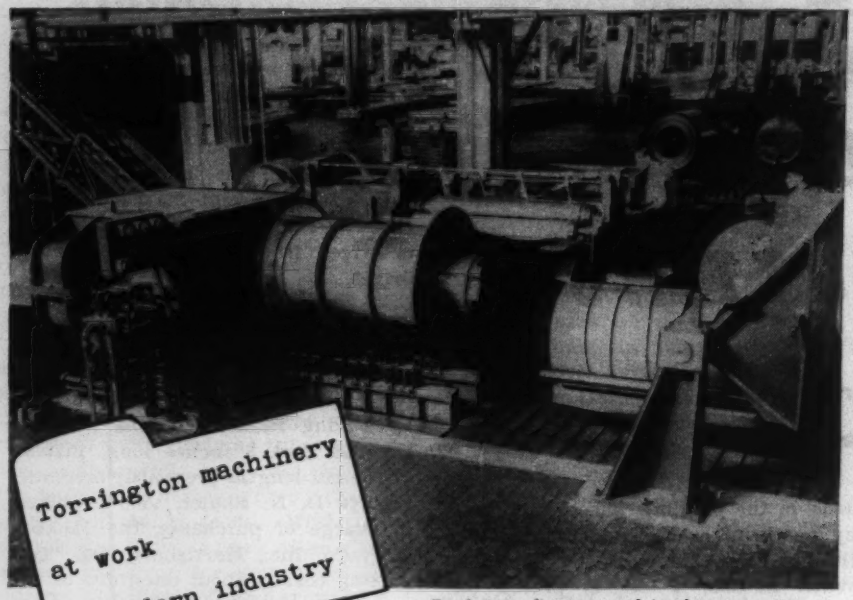
Removes Burrs By Tumbling

"Many of our machined and stamped parts have to be de-burred before being assembled in our precision built regulation equipment. Burrs and sharp edges developed by stamping, drilling, milling or slotting formerly were removed by countersinking, belt sanding, filing, scraping, polishing or wire brushing.

"A tremendous saving has been accomplished by de-burring these parts in a tumbling barrel. Actual savings vary from 100 to as much as 600 per cent. Parts with six drilled holes which had to be de-burred externally at a rate of 500 parts per hour can be de-burred by tumbling at a rate of 3000 per hour or an increase of 600 per cent.

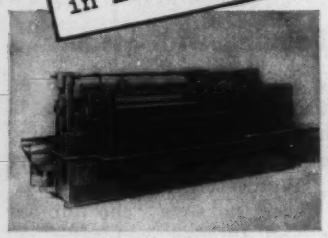
"After the technique has been developed, parts with external threads, knurls or lettering can be de-burred without damage. Rusted ferrous parts can be tumbled using a rust-inhibited compound which completely removes rust from external surfaces.

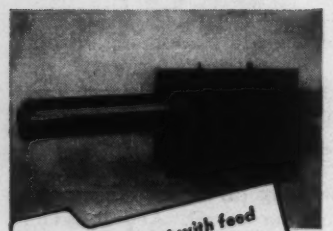
"The term 'tumbling' as applied to this operation is at first distracting and misleading giving the impression of parts being thrown together with



Torrington machinery at work in modern industry

Torrington slitter at work in plant.





Top: Slitter part with feed rolls. Next: Stripper and elevator carriage. Last: Winder.

Torrington's Latest Slitting Equipment in Newest Plant of ALUMINUM COMPANY OF AMERICA

The newly constructed plant of Aluminum Company of America, Davenport, Iowa, houses the last word in slitting equipment by Torrington. This heavy duty machinery combines famous Torrington standards—advanced design—dependable accuracy plus ability to withstand abuse under exacting heavy service. This unit contains feed rolls, slitter, scrap chopper, winder, collapsible block, stripper, elevator carriage upender and scrap conveyor. Outstanding features are:

- Speed as high as 1200 feet per minute
- Rugged, heavy construction for mill production service
- Anti-friction bearings
- Air-operated clutches to allow either pull-through or positive drive operation of slitter
- Swing shelf for inter slitter housing for ease of changing cutter set-ups
- Scrap chopper driver from independent motor
- Power expansion of collapsible block
- Stripping and upending by power

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DESIGNERS AND BUILDERS OF MILL MACHINERY FOR OVER 60 YEARS

the danger of being nicked, peened and otherwise damaged. In reality the process avoids impacts, the parts being immersed in a mixture of granite stones, a soapy abrasive compound and water and rotated in an octagonal barrel at a very low rpm.

"The relatively slow rotary motion produces a scouring effect and the sharp edges and burrs are literally honed to a smooth, rounded finish. Thin wall sections and accurately formed stampings will not lose their shape or dimension in this process." —E. N. Krein, vice president, The Bastian-Blessing Co., Chicago.

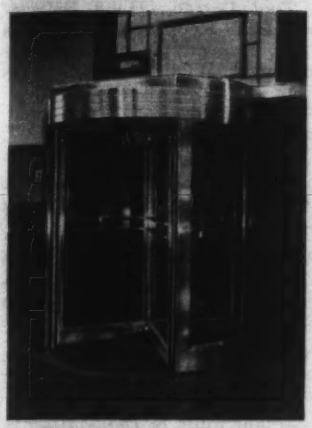
125 Sash Frames Per Hour

Special tooling on a transfer type welder now enables one sash maker to produce a minimum of 125 of the largest size frames per hour. Machine employed, designed by Federal Machine & Welder Co., Warren, O., handles frames of various lengths, through projection, spot welding and hot upsetting operations. In procedure, sash frame is loaded manually into the machine with mullion bars previously inserted in position with ends to be hot upset extending through slots in the longitudinal frame members. Once the frame, hinges and clip are loaded, a push-button start is all that is needed to initiate automatic welding. This includes projection welding two angle hinges—one on each corner on one sash side—and spot welding the channel clip at either end. After hinges and clips are joined, an indexing chain automatically moves the frame into the upsetting station permitting the mullion bars to be hot upset. In the meantime, new work is being loaded into the first station. Finished work is pushed out of the upsetting station by work following it.

Gear Rack Costs Less

Construction of an automotive service tool required a gear rack through the middle section of a ½-inch thick steel bar, the K-D Mfg. Co., Lancaster, Pa., reports. To overcome the excessive cost of machining this from a solid steel bar, the company now simply punches the required opening in five strip steel blanks and fastens them together with small countersunk rivets to make the ½-inch section. Cost is only a fifth to a quarter as much as with the old method.

You can bank on STAINLESS STEEL



at the Pelham Parkway Branch
of The Bronx Savings Bank
(Hubert E. Reeves, Architect)

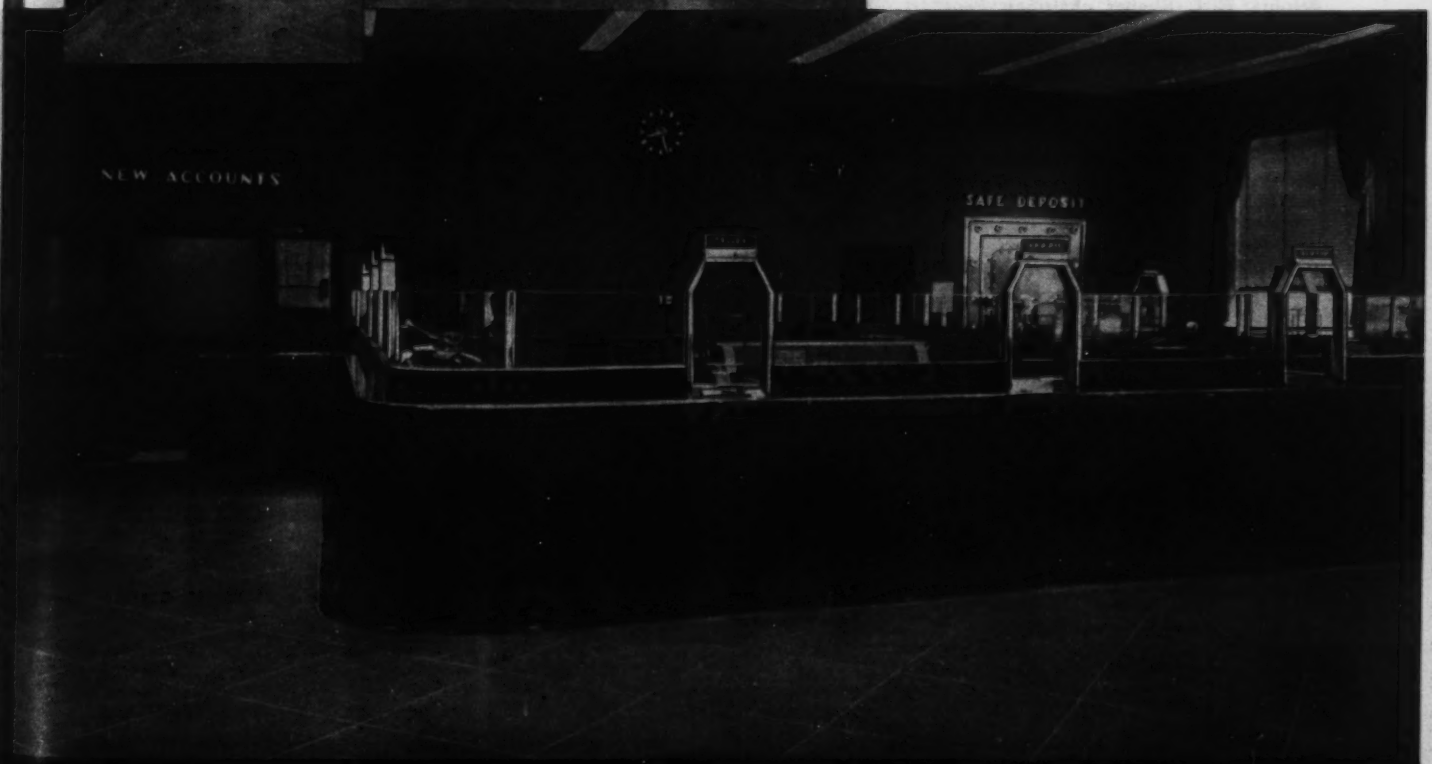
The proven low maintenance cost of stainless steel was a primary reason for its selection for application in the Pelham Parkway Branch of The Bronx Savings Bank.

In this gem of a neighborhood bank, the stainless steel, buffed to a satin finish, gives a pleasing and luxurious appearance.

Stainless steel is also outstanding for its adaptability to architectural forms for both exterior and interior applications, including such a wide variety as curtain walls, window frames, grill doors, ornamental trimmings, and even tiny screws.

To insure the production of consistently high grade stainless steel, the use of ferro chromium of dependable quality and precise analysis is of prime importance. Vancoram Brand Ferro Chromium, made by closely controlled processing methods from carefully selected raw materials, fills these requirements. Low-carbon grades for the manufacture of stainless steel are supplied with a carbon content from 0.06% max. to 2.00% max., all containing from 67% to 72% chromium.

If you have a technical problem involving the making, treatment, fabrication, properties, or performance of stainless steel, our metallurgical engineers will be glad to help you solve it.



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MAKERS OF ALLOYS
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CHEMICALS AND METAL

18th Annual Meeting and Exposition Philadelphia, April 10-14, 1950

PROGRAM
AND SPECIAL EVENTS

EXPOSITION HOURS: 9:00 a.m. to 5:00 p.m. Daily

Monday, April 10

9:30-12:00 Noon—Technical films.

1:00 p.m.—Plant tours to Budd Co., Philco Corp., Westinghouse Electric Corp., Yale & Towne Mfg. Co.

1:30-4:00 p.m.—Technical films.

2:00 p.m.—Technical sessions: *Developments in Pressworking of Metals* (Convention Hall, Ballroom)—

(a) "Forming Sheet Metal by the Marform Process", R. B. Schulze, general supervisor of manufacturing research, Glenn L. Martin Co., Baltimore, Md.

(b) "Carbide Die Developments", G. F. Eglinton, vice president, Lincoln Park Industries, Detroit.

Cold Extrusion of Metals (Convention Hall, Room 200) — J. P. Bowden, Heintz Mfg. Co., Philadelphia.

8:00 p.m. — *Economics Forum* (Philadelphia Academy of Music)—Sponsored by ASTE and a committee of publishers comprising Joseph S. Hildreth, president, Chilton Co., Philadelphia; E. L. Shaner, chairman, Penton Publishing Co., Cleveland; Robert B. Luchars, president, Industrial Press, New York.

Master of Ceremonies: Paul Wooton, president, Society of Business Magazine Editors, Washington.
Introductory Addresses: Robert B. Douglas, president, American Society of Tool Engineers; Walter D. Fuller, president, Curtis Publishing Co., Philadelphia.

Panel: Dr. Edwin G. Nourse, former chairman, Council of Economic Advisors to the President; Dr. C. Canby Balderston, dean, Wharton School of Finance and Commerce; Edward T. Cheyfitz, labor economist; Joseph A. Livingston, business economist.

Tuesday, April 11

9:00 a.m.—Technical session: *Design and Use of Die Casting Dies* (Convention Hall, Room 200)—Charles Franklin, master mechanic, Rochester Products Division, General Motors Corp., Rochester, N. Y.

9:00 a.m.—Plant tours to Baldwin Locomotive Works; Crown Can Co.; Link-Belt Co.; RCA Corp. (Camden), and SKF Industries Inc.

9:30-12:00 Noon—Technical films.

10:00 a.m.—Meeting of ASTE National Education Committee, Benjamin Franklin Hotel.

1:00 p.m.—Plant tours to Budd Co.; Philco Corp.; Westinghouse Electric Corp.; and Yale & Towne Mfg. Co.

1:30-4:00 p.m.—Technical films.

2:00 p.m.—Technical sessions: *Automation of Ground and Turned Production Parts* (Convention Hall, Room 200)—N. L. Bean, chief design engineer, automatic transmission program, Ford Motor Co., Dearborn, Mich.

Machining and Fabrication of High-Temperature Alloys (Convention Hall, Ballroom)—C. L. Sadon, manufacturing engineer, Aircraft Gas Turbine Division, General Electric Co., Cincinnati, O.

8:00 p.m.—Technical sessions: *Machinability* (Benjamin Franklin Hotel Ballroom)—R. T. Hurley, president, Curtiss Wright Corp., New York.

Trends in Drilling (Bellevue-Stratford Hotel, Rose Room)—

(a) "Application of Special Drill Units to Standard and Special Machinery", Eugene Numrich, application engineer, Avey Drilling Machine Co., Covington, Ky.

(b) "Micro Drilling", J. A. Cupler II, general manager, National Jet Co., Cumberland, Md.

Wednesday, April 12

9:00 a.m.—Technical session: *Metamics* (Convention Hall, Room 200)—W. O. Sweeny Jr., assistant sales manager, Haynes-Stellite Division, Union Carbide & Carbon Corp., New York.

9:00 a.m.—Plant tours to Baldwin Locomotive Works; Crown Can Co.; Link-Belt Co.; RCA Corp. (Camden), and SKF Industries Inc.

9:30-12:00 Noon—Technical films.

10:00 a.m.—ASTE House of Delegates caucus (Benjamin Franklin Hotel).

1:00 p.m.—Plant tours to Budd Co.; Philco Corp.; Westinghouse Electric Corp.; and Yale & Towne Mfg. Co.

1:30-4:00 p.m.—Technical films.

2:00 p.m.—Technical sessions: *Cold Roll Forming of Metals* (Convention Hall, Room 200)—E. J. Vanderploeg, development engineer, Yoder Co., Cleveland.

Automation (Convention Hall, Ballroom)—

(a) "Automation in Forging and Heat Treating", speaker from Oldsmobile Division, General Motors Corp., Lansing, Mich.

(b) "Automation in the Press Room", Herman Zorn, president, V & O Press Co.

8:00 p.m.—Technical sessions: *Tooling Up for Modern Truck Engine Production* (Benjamin Franklin Hotel, Ballroom) — Joseph Olender, mechanical engineer, International Harvester Co., Chicago.

Use of Element Time Data for Effective Tool Design (Hotel Bellevue-Stratford, Rose Room)—N. M. Perris and H. K. Keever, partners, Stevenson, Jordan & Harrison Inc., Cleveland.

Thursday, April 13

9:00 a.m.—Technical session: *Hard Surfacing of Production Tools and Gages* (Convention Hall, Ballroom)—

(a) "Nitriding of High Speed Steel Tools and Gages", J. G. Morrison, chief metallurgist, Landis Machine Co., Waynesboro, Pa.

(b) "Hard Chrome Plating", B. A. Taylor, vice president, Chrome Electro-Forming Co., Detroit.

9:00 a.m.—Plant tours to Baldwin Locomotive Works; Crown Can Co.; Link-Belt Co., RCA Corp. (Camden), and SKF Industries Inc.

9:30-12:00 Noon—Technical films.

10:00 a.m.—Meeting of ASTE Board of Directors (Benjamin Franklin Hotel).

10:00 a.m.—Meeting of ASTE House of Delegates (Benjamin Franklin Hotel, Ballroom).

1:00 p.m.—Plant tours to Budd Co.; Philco Corp.; Westinghouse Electric Corp.; and Yale & Towne Mfg. Co.

1:30-4:00 p.m.—Technical films.

2:00 p.m.—Technical sessions: *Broaching Applications for Cost Reduction* (Convention Hall, Ballroom)—O. W. Bonnafe, chief research engineer, LaPointe Machine Tool Co., Hudson, Mass.

Automation in Hopper Feeds for Assemblies (Convention Hall, Room 200) —C. E. Kraus, president, Kraus Design Inc., Rochester, N. Y.

7:00 p.m. — ASTE Eighteenth Annual Meeting Banquet (Bellevue-Stratford Hotel, Ballroom).

Friday, April 14

9:00 a.m. — Technical session: *Design Economics* (Convention Hall, Ballroom)—John VanHamersveld, supervisor, design cost control group, Glenn L. Martin Co., Baltimore.

9:00 a.m.—Plant tours to Baldwin Locomotive Works; Crown Can Co.; Link-Belt Co.; RCA Corp. (Camden), and SKF Industries Inc.

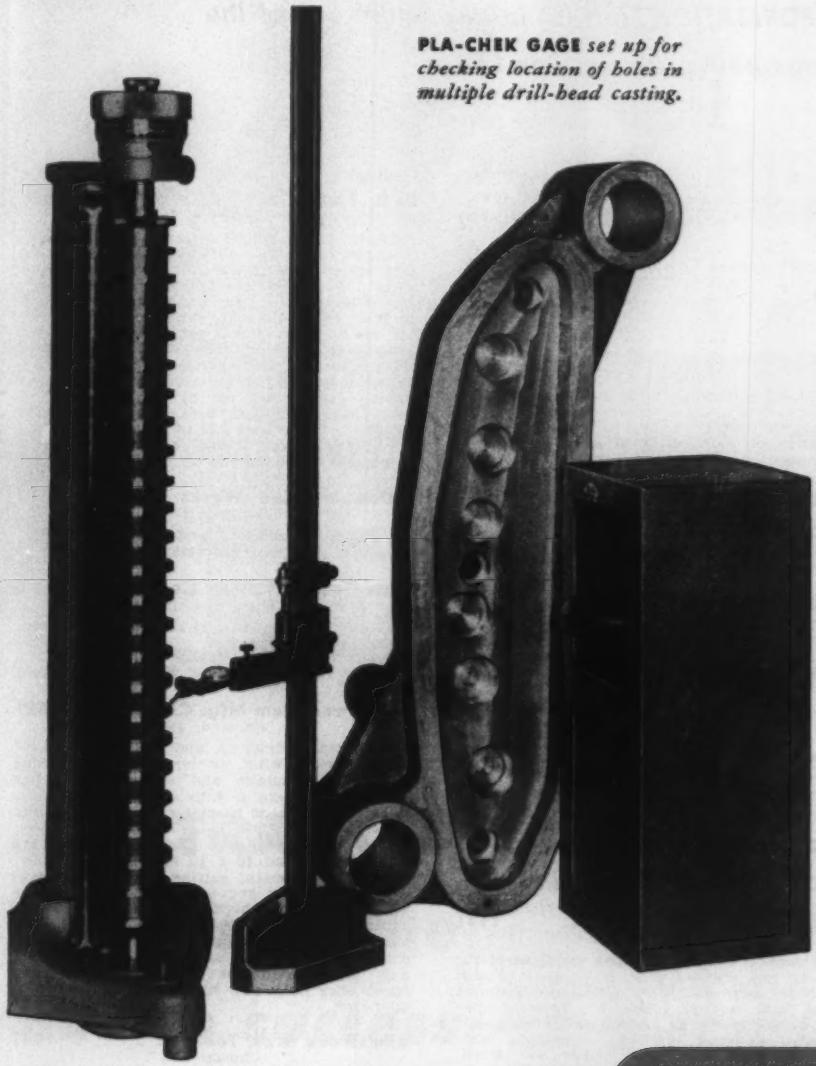
9:30-12:00 Noon—Technical films.

1:30-4:00 p.m.—Technical films.

2:00 p.m.—Technical sessions: *Investment Casting* (Convention Hall, Ballroom)—T. F. Frangos, sales engineer, Haynes-Stellite Division, Union Carbide & Carbon Corp., New York.

Effect of Latest American Standards on Spindle Deflections (Convention Hall, Room 200)—Dr. Max Kronenberg, consulting engineer.

Cadillac "PLA-CHEK" insures split-tenth accuracy, solves wear problem with GRAPH-MO steel



PLA-CHEK GAGE *set up for checking location of holes in multiple drill-head casting.*

USED in surface plate work, this unique height gage enables measurements to be taken five to twenty times as fast as the usual method of setting up gage blocks. It gives a guaranteed accuracy of .0001" in 24 inches. Dimensions are checked from 1-inch steps on an adjustable space bar, fitted with a micrometer at the top.

To insure constant accuracy, the steel used for this long bar must possess exceptional stability. The measuring surfaces, as well as the micrometer lead screw, must resist wear in continuous service.

The Cadillac Gage Company uses Graph-Mo steel to solve both problems. Graph-Mo has outstanding stability. Due to the diamond-hard carbides in its structure, it offers stubborn resistance to wear. Yet because it contains free graphite, it machines fast and easily to precision limits. Graph-Mo hardens uniformly with minimum distortion. It gives an extremely fine finish after the grinding operation.

Graph-Mo is one of the four Timken® graphitic steels now widely used in industry for gages, dies, machine parts and many other applications. For the latest information, write for the new, enlarged 9th edition of the Timken Graphitic Steel Data Book. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.

New Products and Equipment

FEATURED BY EXHIBITORS AT THE COST-CUTTING ASTE EXPOSITION

PHILADELPHIA APR. 10-14, 1950

SEE THESE new products, equipment and methods at the Philadelphia show or, FOR MORE INFORMATION, just fill in and return one of the postage-paid cards on page 153

PRODUCTS and methods preceded by an asterisk (*) are being introduced for the first time at this exposition.

Company — **Booth No.**

Accurate Bushing Co. — 142
Garwood, N. J.

To Exhibit — Drill jig bushings, precision ground parts, wear resistant bushings, punches, button dies

Ace Abrasive Laboratories — 1148
New York, N. Y.

To Exhibit—*Star Dust laboratory-graded pure diamond lapping compound in an assortment of grit sizes ranging from coarse for heavy stock removal to micron for mirror finishes; Star Dust laboratory-graded pure diamond powders

Acme Steel Co. — 234
Chicago, Ill.

To Exhibit—Model N2A-8 and N2C-25 Acme-Morrison metal stitchers, capable of stitching metal to metal, or to nonmetallic materials, such as rubber, wood, asbestos, etc., without prepunching, drilling or matching of parts as steel wire punches its own holes

Acme Tool Co. — 766
New York, N. Y.

To Exhibit—Universal tool holder, surface plates, angle plates, straight edges, tool makers' specialties

Adamas Carbide Corp. — 406
Harrison, N. J.

To Exhibit—Tungsten carbide tool tips, dies, wear parts

Adel Precision Products Corp. — 1040
Burbank, Calif.

To Exhibit—Operating display of various hydraulic units

Air Speed Tool Co. — 728
Los Angeles, Calif.

To Exhibit—Air-driven saw and file

Airborne Accessories — 1122
Hillside, N. J.

To Exhibit—*Surface grinder

Ajax Electric Co. Inc. — 434
Philadelphia, Pa.

To Exhibit—Ajax Hultgren electric salt bath furnace installation, batch and mechanized units illustrated; sample products from cotter pins to automobile bumpers displayed and documented to show advantages of salt bath processing

Allegheny Ludlum Steel Corp. — 618
Pittsburgh, Pa.

To Exhibit—*B-47 hot work die steel; range of tool steels, including high speed, cold work, hot work, shock resisting and carbon tool steel offered in bars, forgings, flat rolled strip, coils and blanks, cast-to-shape, composite drill rod and tool bits; Carmet sintered carbide alloys, featuring carbide dies used in blanking, forming and drawing; carbide wear parts; Carmet-tipped cutting tools

Allen Mfg. Co. — 524
Hartford, Conn.

To Exhibit—Hex-socket set screws, socket head cap screws, hex-socket pipe plugs, hex-socket shoulder screws, flat head cap screws, dowel pins, hex keys, square head set screws, Allenuts

Allied Products Corp. — 665
Detroit, Mich.

To Exhibit — Standardized interchangeable punches and dies

Allison Co. — 206
Bridgeport, Conn.

To Exhibit—*Resinoid bond cutting wheel for dry cutting of metals, ceramics, etc., use to be demonstrated on a typical machine; demonstration of wet cutting of a wide range of materials

Alpha Corp. — 718
Greenwich, Conn.

To Exhibit—Universal testing machine in operation to demonstrate extreme-pressure lubricant

American Machine & Foundry Co. — 659
New York, N. Y.

To Exhibit—(Wahlstrom Tool Division): Model A, B and C fully automatic drill chucks, automatic tapper; (DeWalt Inc. Division): *Power feed for use with DeWalt radial arm saws, radial arm saws, model GER medium arm, power shop model GS

American Pullmax Co. Inc. — 958
Chicago, Ill.

To Exhibit—Five models of sheet steel and plate-cutting equipment

B. C. Ames Co. — 710
Waltham, Mass.

To Exhibit—Micrometer dial indicators

Ampco Metal Inc. — 1131
Milwaukee, Wis.

To Exhibit—*Grade 24 Ampco metal, used for forming and drawing dies, which may be cast to shape and machined; guidepost bushings made from Ampco grade 21; forming dies made from grade 22; examples of materials produced as sand castings, centrifugal castings, extruded solid and hollow bar stock, rolled sheet and plate, forgings, arc and resistance welding electrodes

Amplex Mfg. Co., Chrysler Corp. Subsidiary — 1107
Detroit, Mich.

To Exhibit—*Permanent filter elements, finished machine parts and oil-cushioned bearings produced from Oilite stainless steel powders, for applications where corrosion resistance is required and in which contamination must be avoided; *Amplex-made finished machine parts; Oilite heavy duty oil-cushioned bearings; Oilite finished machine parts; Oilite permanent filters; Oilite friction units, including units made of Oilite bronze, super-Oilite, iron Oilite, Oilite stainless steel and Oilite brass

Anderson & Sons — 329
Westfield, Mass.

To Exhibit—Cutting fluids, rust preventives

F. E. Anderson Oil Co. — 422
Portland, Conn.

To Exhibit—*Lusol, a bland water soluble coolant, which makes possible increased tool life, greater machine speeds, working at lower temperature, finer finishes

Company — **Booth No.**

R. B. Annis Co. — 1056
Indianapolis, Ind.

To Exhibit—*Model M2 dynamic balancing machine for precision balancing of high speed rotating parts weighing up to 20 pounds; employs a photoelectric scanning arrangement to determine phase of unbalance, the phase and amount being plotted simultaneously on a cathode ray tube; nodal bar arrangement gives independent readings for each end of rotor. Electric etcher for operation on alternating current lines; writes on hardened steel or iron; etching heat is selected by a six-position selector switch; stylus stays cool for operator comfort. Several models of 56 standard sizes of demagnetizers for tool rooms and production shops exhibited

Anton Machine Works — 17
Brooklyn, N. Y.

To Exhibit—Hardened and ground parallels, magnetic parallels, magnetic V-blocks

Apex Tool & Cutter Co. — 5
Shelton, Conn.

To Exhibit—*Inserted tool holders for use with interchangeable tool bits, all standard shapes; inserted tooth milling cutters, holders and tools; complete line of tools for railroad shop work

Armstrong-Blum Mfg. Co. — 521
Chicago, Ill.

To Exhibit—*Series 6A and *9A Marvel automatic hack sawing machines which combine both full automatic and semiautomatic bar push-up to attain a fully universal machine, suited for work of normal cut-off lengths and semiautomatic work involving long bar movements of 78 inches and longer; capacities are 6 x 6 inches and 10 x 10 inches, respectively. No. 8 Marvel metal cutting band sawing machine performing angular work; No. 4B Marvel standard duty high speed hack saw; No. 1 and 2 Marvel dry cutting show saws; No. 18 Marvel hydraulic roll-stroke hack sawing machine, 18 x 18-inch capacity, cutting billets and heat-treated die blocks; Marvel high speed edge hack saw blades and hole saws in operation

Armstrong Bros. Tool Co. — 1047
Chicago, Ill.

To Exhibit—Cutting Tools

Arc Equipment Corp. — 741
Bryan, O.

To Exhibit—*Model 7165 air-powered electrode dress for restoring contour of electrodes used in resistance welding machines; *model 7200 light weight air-operated heavy duty 6-inch vertical grinder; *model 7025 light weight air-operated vertical sander; air-operated screw drivers, nut runners, sanders, balancers, oilers, filters, speed couplers and mixing motors

E. C. Atkins & Co. — 654
Indianapolis, Ind.

To Exhibit—Automatic cutoff machines, pipe and bolt threading machines

Atlas Press Co. — 1008
Kalamazoo, Mich.

To Exhibit—*Improved 15-inch drill presses in high and slow speed models, with full tilting or production oil table. Jacobs chuck or No. 1 or 2 Morse taper spindle; offered in bench and floor types, production base and two, three and four spindle drills, 10-inch lathes, milling machines, 7-inch metal shapers, grinder

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Joe was on his way to setting a new sales record. Then came that wire from the home office . . .

Corrosion had caused a rivet to fail on a vital piece of processing equipment; other fastening failures were anticipated; production had to be stopped temporarily.

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Make one cut do the work of two

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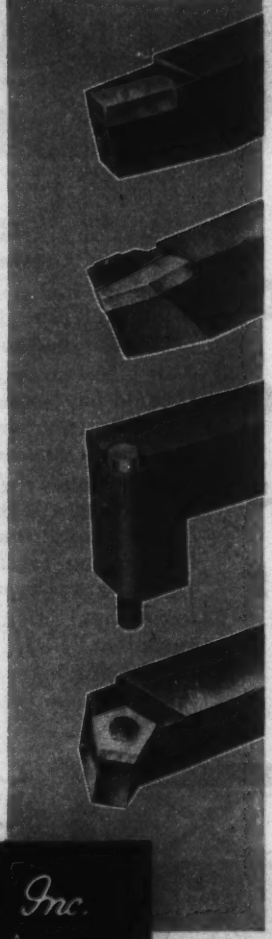
Eliminate unnecessary machine downtime

Reduce or eliminate grinding expense

Keep tool inventories to a new low



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LATROBE PA U S A
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AND CUTTING TOOLS THAT INCREASE PRODUCTIVITY

ASTE EXPOSITION

Company	Booth No.

Austenal Laboratories Inc. 520
New York, N. Y.

To Exhibit—*Precision castings manufactured by Microcast process, made in high temperature alloys, low alloys, SAE and NE steels and tool steels

W. O. Barnes Co. 339
Detroit 14, Mich.

To Exhibit—Metal cutting hacksaws and bandsaws

Bausch & Lomb Optical Co. 407
Rochester, N. Y.

To Exhibit—*No. 33-14-42 optical thickness measure, contour measuring projector 1⅞ and 4¼ inch para-plane gages, toolmakers' microscope, Brinell microscopes, shop microscopes, workshop contour projector; wide field stereo microscopes, wide field tubes, microscope body tubes for scale reading and similar purposes

Bay State Abrasive Products Co. . 966
Westboro, Mass.

To Exhibit—*DuraCut abrasive disks, *Saf-T-Cut abrasive disk wheels, Bayflex abrasive disk wheels, diamond wheels, mounted points, crankshaft grinding wheels, tool grinding wheels

Bay State Tool & Machine Co. ... 35
Springfield, Mass.

To Exhibit—Hand tapping machine, toolroom vises, adjustable parallels, thread grinding attachments

Beaver Tool & Engineering Corp. . . 433
Royal Oak, Mich.

To Exhibit—*Quick change holders and adaptors for all types of milling and boring machines; solid carbide blade milling cutters; arbors, adaptors, special tools, other milling and boring machine accessories

Bellows Co. 802
Akron, O.

To Exhibit—Air motor, air feeds, air vises, air-powered rotary feed tables, air cylinders, air valves, air-powered impact presses

Bemis & Call Co. 1054
Springfield, Mass.

To Exhibit—Millmaster milling attachment for vertical and horizontal milling machines

Benchmaster Mfg. Co. 1150
Los Angeles, Calif.

To Exhibit—Punch presses, milling machine, roll feeds, vises, accessories

Bendix-Westinghouse Automotive Air Brake Co. 333
Elyria, O.

To Exhibit—Air-actuated fixtures

Benzon Machine Co. 658
Lansdale, Pa.

To Exhibit—*Co-ordinator attachment for machine tools of boring and drilling type for fast and accurate control of multiple hole location. Device uses preformed records cut in resinoid plastic cylinders, which are made in a *Recorder, a portable machine

Black Drill Co. 724
Cleveland, O.

To Exhibit—Drill press, drilling units

Edward Blake Co. 919
West Newton, Mass.

To Exhibit—Black Diamond drill grinders, tap grinders, flute grinder, Waltham cutter sharpener, Baird surface finish standards, American tool holders

Henry P. Boggis & Co. 401
Cleveland, O.

To Exhibit—*Hybco small dry abrasive tool room cutoff machine, model 1100 Hybco tap grinder and grinding fixtures

Boice Crane-Co. 1139
Toledo, O.

To Exhibit—*All-purpose combination contour saw and band filer, No. 2300 series metal cutting band saw, No. 2600 series helmet head

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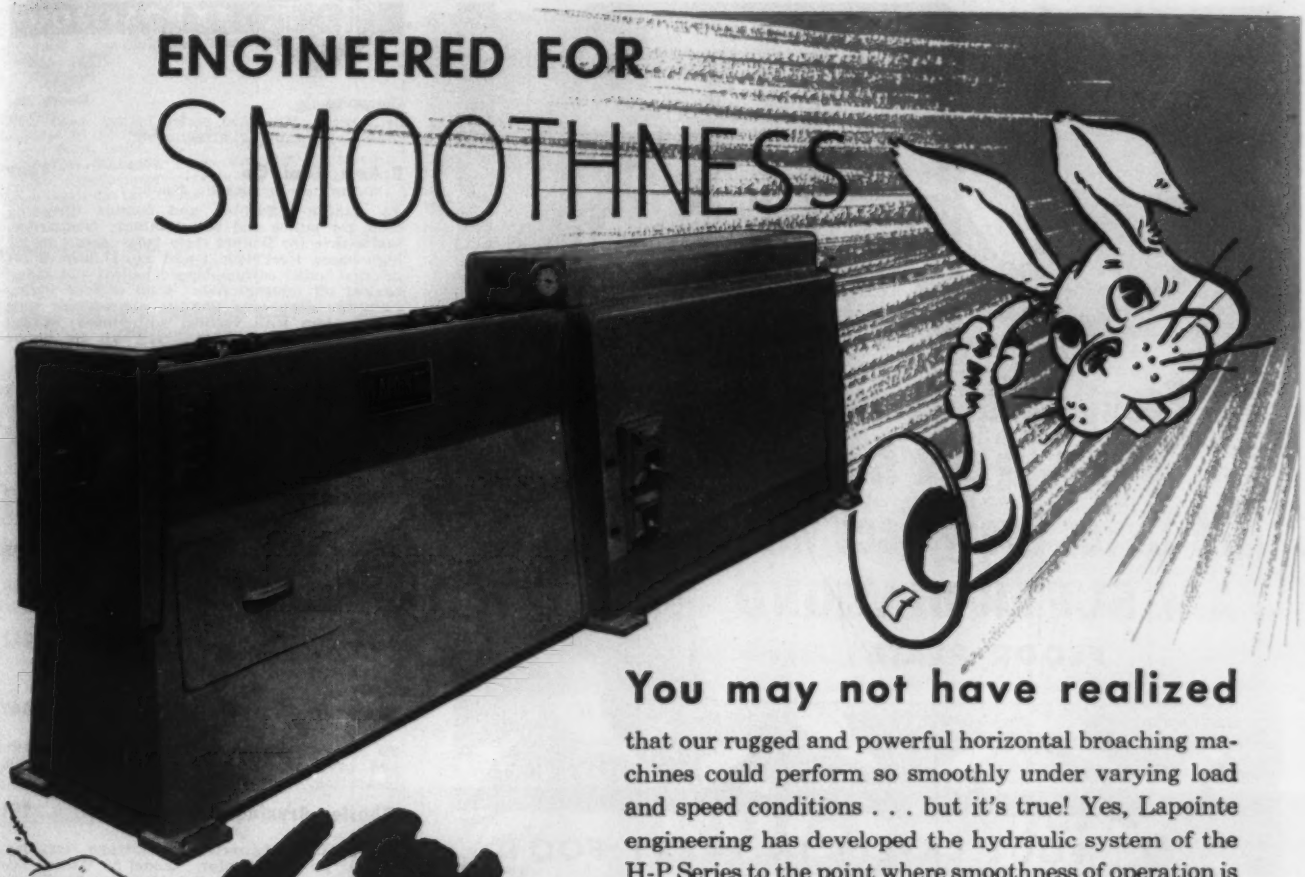
FURTHER INFORMATION

ENGINEERED FOR SMOOTHNESS



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The NEW "H-P" SERIES HORIZONTAL BROACHING MACHINES WITH LONGER STROKES

are made in 8 standard sizes ranging from 2½ to 50 Ton capacity, and 30-inch to 78-inch stroke. Our new Bulletin gives engineering data and complete specifications on the H-P Series. May we send you a copy?

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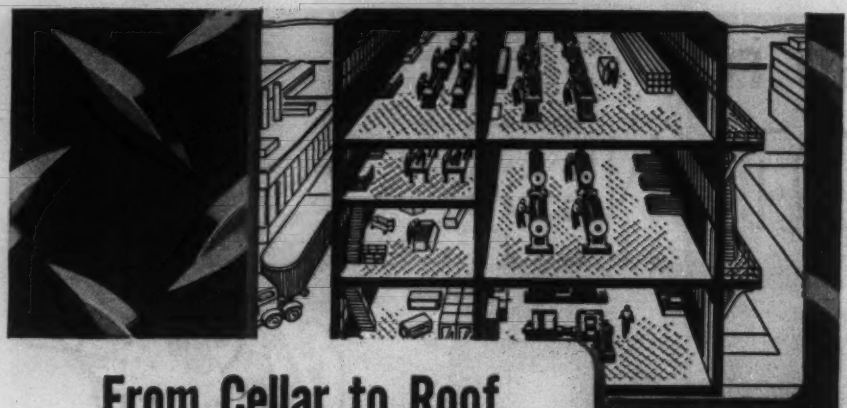

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ASTE EXPOSITION

Company — **Booth No.**

drill press, No. 2600 series helmet head drill press with tapping attachment

Bokum Tool Co. 1049
Detroit, Mich.

To Exhibit—*Turning and outside threading tools for lathes and turret lathes; *resharpening fixture for Bokum tools from sizes 4 to 12; high speed steel helical and radial backed off internal tools; carbide-tipped helical and radial backed off internal tools; solid carbide boring tools for deep hole boring; appropriate rigid tool holders with vertical adjustment; special jig boring sets for practically all jig borers on the market

Boyar-Schultz Corp. 133
Chicago, Ill.

To Exhibit — *Screw machine tools, profile grinders, surface grinders, copper head laps, S.M.B. machine bolts

Bramson Publishing Co. 657
Detroit, Mich.

Bridgeport Machines Inc. 1031
Bridgeport, Conn.

To Exhibit—Turret milling machines, high speed milling and shaping machines

Brinnell Co. 567
Granby, Conn.

To Exhibit—Electronic testing equipment

Brown & Sharpe Co. 849
Providence, R. I.

To Exhibit—Machinists' tools, cutters, arbors and adaptors, screw machine tools, electronic measuring equipment, gage blocks

Charles Bruning Co. Inc. 801
Chicago, Ill.

To Exhibit—*Lettering set, *type transfer, *model 10 Whiteprinter, *model 50 Whiteprinter, model 11 Whiteprinter, model 21 Whiteprinter, model 93 Whiteprinter, hollow-shaft electric erasing machine, Equipoise drafting machine, detail drafting machine, Perspect-O-Metric, 5 and 10-inch slide rules, Hamilton Autoshift drafting table

Brush Development Co. 33
Cleveland, O.

To Exhibit—Instruments for quality control, machine strain capacity determinators

Bryant Chucking Grinder Co. 3
Springfield, Vt.

To Exhibit—*No. 11 external bench type thread gage; *No. 11 internal bench type thread gage; *squareness-of-face attachment for No. 11 gage; No. 11 three-fluted tap gage; No. 1 internal portable thread gage; No. 2 external bench type gage with underface squareness-of-face attachment; No. 2 adjustable external (bench type) thread gage for diameters from 1 to 2½ inches; No. 2 internal portable thread gage; No. 2 internal bench type plain diameter gage with squareness-of-face attachment; No. 3 internal bench type thread gage and squareness-of-face attachment

Cadillac Gage Co. 924
Detroit, Mich.

To Exhibit—Various types of gages

Cadillac Stamp Co. 753
Detroit, Mich.

To Exhibit—*No. 45 hydraulic marking machine, *speed marker, *Automark pneumatic marking machine, *Automark pneumatic branding machine, *Automark electric metal marking typewriter, *steel stamps and marking devices

Campbell Machine Div., American Chain & Cable Co. Inc. 226
Bridgeport, Conn.

To Exhibit—*Model 406 wet abrasive cut-off machine, *model 270 fully automatic cut-off machine for handling material up to 2 inches in diameter, *rotary cut-off machine, *nibbling machine, complete line of abrasive cut-off machines and nibblers

Carboloy Co. Inc. 736
Detroit, Mich

To Exhibit—*"Live-Spiral" masonry drills, *heading hammers with markings, *latest ap-

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FURTHER INFORMATION

Company — Booth No.

plications of Carboloy, standard cutting, boring and form tools, blanks, lathe centers, special blanks, diamond wheel dressers, diamond grinding wheels, applications of Carboloy cemented carbide to reduce wear in mechanical products

Carborundum Co. **1101**
Niagara Falls, N. Y.
To Exhibit—Abrasive products

Chicago Rivet & Machine Co. ... **1123**
Bellwood, Ill.
To Exhibit—*No. 53 automatic tubular rivet setter, with double cam action, designed to set tubular rivets in ceramics, plastics and other brittle material; No. 560 automatic feed rivet setting machine, bench model, capacity 0.040 to 0.088-inch in steel and 0.098-inch brass tubular rivet; No. 214 automatic double rivet setter with 14-inch throat, capable of setting two rivets at one time, with adjustable centers; No. 912 automatic feed rivet setter, single pedestal type

Chilton Co. **210, 408**
Philadelphia, Pa.

Chrome Electro-Forming Co. **955**
Detroit, Mich.
To Exhibit — *Following parts hard chrome plated to size with no grinding after plating: Axle shafts, wheel spindles, thread gages, aircraft parts, transmission shafts, ring gears, taps, draw dies, pinion gears

Circular Tool Co. **225**
Providence, R. I.
To Exhibit—High speed circular saws

Cities Service Oil Co. **636**
New York, N. Y.
To Exhibit—Cutting fluids

Cleveland Industrial Tool Corp. .. **1159**
Euclid, O.
To Exhibit—*Citco hydraulic diamond turner for turning diamond tools automatically, Citco solid copper diamond tools

Clinton Machine Co. **1057**
Clinton, Mich.

Colonial Broach Co. **1021**
Detroit, Mich.
To Exhibit—Examples of broached parts

Commander Mfg. Co. **426**
Cnicago, Ill.
To Exhibit—Model 500 and 900 Multi-Drills (adjustable multiple spindle drilling heads) for drilling up to 6 or 8 holes in any conceivable hole pattern within their respective bolt circles; drill capacities to ⅝-inch in steel, larger in other materials. Tapper, with adjustable torque control, capable of handling any tap size from 0 to ¾-inch, will fit any drill press

Conover-Mast Publications Inc .. **308**
New York, N. Y.

Cox Engineering & Sales Co. **203**
Detroit, Mich.
To Exhibit—Industrial products

Arthur A. Crafts Co. **229**
Boston, Mass.
To Exhibit—Diamond tools

C. C. Craley Mfg. Co. **1149**
Shillington, Pa.
To Exhibit—Offset boring heads and tools

F. M. Crayton Co. **546**
Philadelphia, Pa.
To Exhibit—T-slot bolt for clamping applications

Crystal Lake Grinders **740**
Crystal Lake, Ill.
To Exhibit—*Two 6 x 12 x 15-inch height over chuck, temperature controlled spindle, wet surface grinders, one grinding gage blocks to mirror finish, the other equipped with Pratt & Whitney Diaform attachment demonstrating form grinding; redesigned universal grinder; semiuniversal grinder

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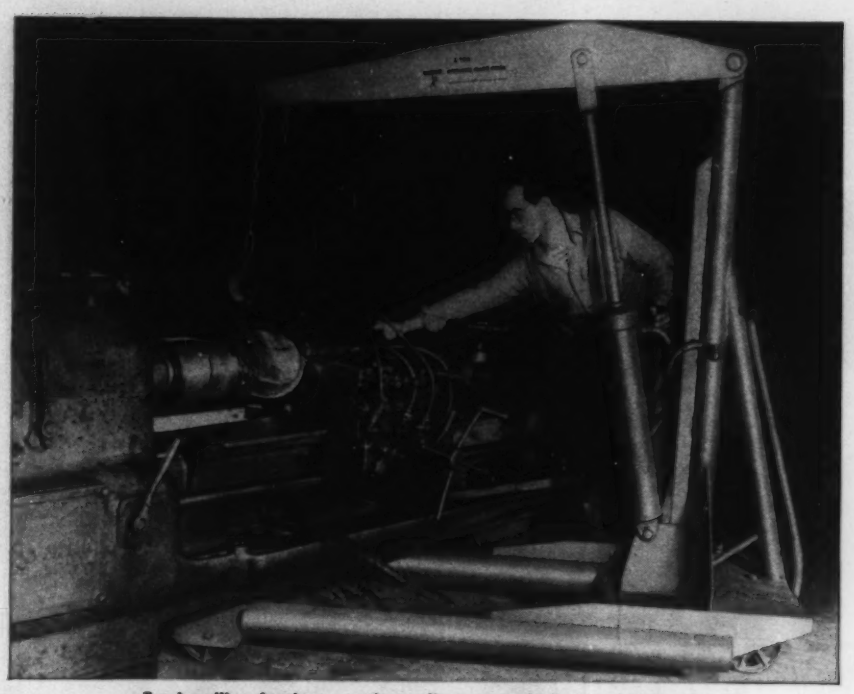

For handling forgings, castings, dies, general plant maintenance and millwright work. Lift to 13 ft.; capacities to 6000 lbs.

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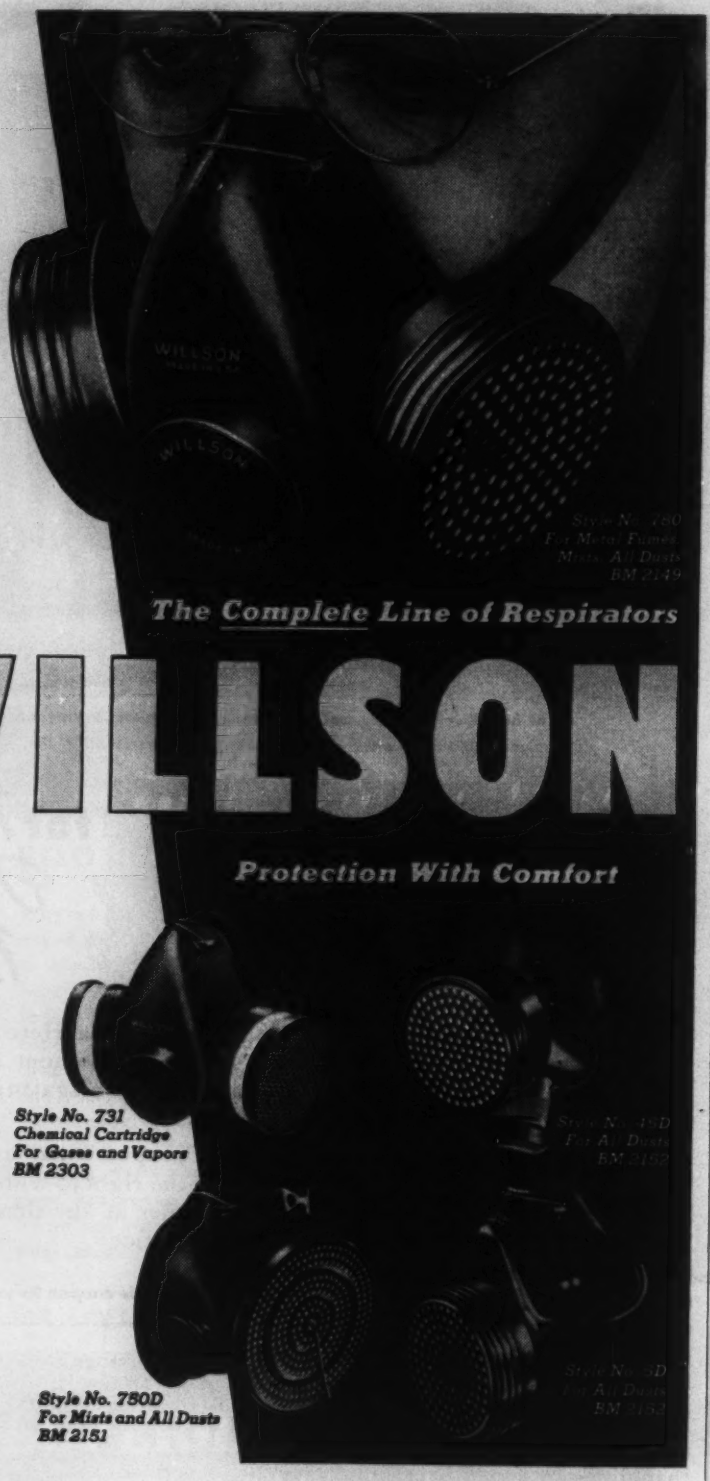

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ASTE EXPOSITION

Company	Booth No.

Cushman Chuck Co. 866
Hartford, Conn.
To Exhibit—*2 and *3-jaw aluminum body air chucks, *aluminum body high speed air cylinders, *3-jaw compensating jaw chucks, *power wrench and controls; air-operated power chucks; Accralock chucks with precision jaw adjustment, manufacturing chucks, screw adjustable jaw chucks, collet chucks, 2-jaw gib type chucks, rotating air cylinders; wrench operated chucks; independent chucks, self-centering geared scroll chucks, combination chucks, collet chucks, light duty chucks

Cycloid Corp. 23
Chicago, Ill.

Dake Engine Co. 1014
Grand Haven, Mich.
To Exhibit—*Model No. 50DT 50-ton hydraulic air-operated die tryout press; model No. UT10A 10-ton utility press

Danly Machine Specialties Inc. .. 850
Chicago, Ill.
To Exhibit—Die sets, diemakers' supplies

DCMT Sales Corp. 412
New York, N. Y.
To Exhibit—*Model M55A/HF 1 hp air-operated high speed small die casting machine with air-operated opening and closing unit; M55A/HF air-operated high speed small die casting machine with manually operated opening and closing unit; ADC-56 aluminum cold chamber die casting machine; display of die castings

deCastro & Associates 1058
Huntington Park, Calif.
To Exhibit—*Speedex 5-ton dial feed press; *Speedex model A-24 dial feed; Speedex model A-12 universal dial feed for punch presses and drill presses; Speedex-Knapp automatic drill press feed

Delaware Tool Steel Corp. 429
Wilmington, Del.
To Exhibit — Controlled-atmosphere electric heat treating furnace

Denison Engineering Co. 1032
Columbus, O.
To Exhibit—*Stock feed accessory, *high pressure pumping unit, *surge damping valve, *fluid motors, 25-ton capacity Multipress with index table, Multipress midget with dial feed accessory, 8-ton capacity Multipress, variable volume pumps, pressure control valves, four-way valves

Detroit Broach Co. 505
Detroit, Mich
To Exhibit — *Big-Boy, the world's largest broach; broaches and broached parts, each showing production savings over previous methods

Detroit Power Screwdriver Co. ... 939
Detroit, Mich.
To Exhibit—*Magazine feed, power driven nut driving machine; magazine feed, power driven screwdrivers; motorized hopper units (selective feeding devices)

Detroit Stamping Co. 321
Detroit, Mich.
To Exhibit—Metal stampings, coatings, engraving

H. E. Dickerman Mfg. Co. 771
Springfield, Mass.
To Exhibit—*Feed mounting adapter, hitch feeds, die feeds, 9-inch Rol-Di-Feed, stock reel

Eugene Dietzgen Co. 865
New York, N. Y.
To Exhibit—Drafting equipment

H. J. Dion Co. 6
Detroit, Mich.
To Exhibit—Tongue clutches

DoAll Co. 121
Des Plaines, Ill.
To Exhibit—*Contour-matic band machining tool, with complete hydraulic operation in its

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Take coke produced from skillfully blended coals . . . combine with carefully prepared and sized iron ore . . . smelt in modern blast furnaces . . . add good operating practices . . .

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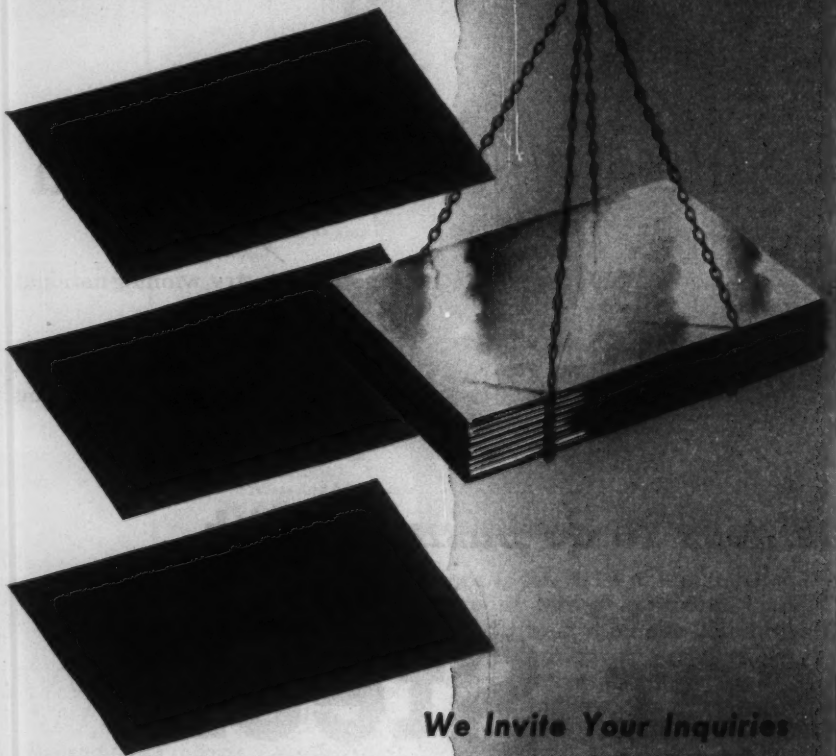

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Plants: Chicago, Illinois; New Castle, Indiana; Kalamazoo, Michigan

ASTE EXPOSITION

Company — **Booth No.**

control of tool speed, work table feed, tool post, table tilt, blade tension and brakes; operation is controlled from a central panel; work-holding facilities are on table; speeds infinite variable from 40 to 10,000 feet per minute; 27 band cutting tools permit sawing, milling, filing, grinding, honing and polishing. *Line milling, on the Contour-matic, is performed by a band cutting tool with tungsten carbide tipped teeth, cutting rates having been doubled with 100 per cent longer tool life; blade lubrication for this operation is provided; *Line grinding with tough alloy band on which cubical molded abrasive matrices are welded in form of teeth; available in 54, 60, 70 and 80 grit; used with coolant. *Cool grinding demonstrated, showing how this grinding method cools the work and the cut; provides full visibility at all times; coolant is injected through the grinding wheel

Donovan Inc. 1
Philadelphia, Pa.
To Exhibit—Heat treating equipment

D-S Grinder Division, Royal Oak Tool & Machine Co. 517
Royal Oak, Mich.
To Exhibit—*Chip breaker grinding fixture for tungsten carbide insert type bits, D-S radial relief grinding fixtures

Dumore Co. 959
Racine, Wis.
To Exhibit—Industrial power tools

Eastman Kodak Co. 816
Rochester, N. Y.
To Exhibit—*Kodak contour projector model 2, an optical comparator providing 14¾ inches of work space between lamphouse and lens, regardless of magnification; work table is 20 inches long; vertical travel is 4 inches; ball bearing mounted six-station lens turret permits selection of any of six magnifications: 10, 20, 31.25, 50, 62.5 and 100. Kodak Conju-Gages

Edgcomb Steel Co. 618
Philadelphia, Pa.
To Exhibit—Tool steel, forgings and castings

Elgin National Watch Co. 306
Elgin, Ill.
To Exhibit — (Industrial Products Division): *Dymo abrasive diamond compound, *Elgiloy spring alloy and fabricated parts, sapphire wire and thread guides, sapphire-tipped dial indicator contact points, sapphire bearings

Enco Mfg. Co. 303
Chicago, Ill.
To Exhibit—*Miti-Mite magnetic base indicator holders, *Miti-Mite magnetic base Handi*lines, *Handlever hexturret bed turrets, turret tool posts, tailstock turrets, pilot wheel hexturret bed turrets

Engineers Specialities Div., Universal Engraving & Colorplate Co. Inc. 129
Buffalo, N. Y.
To Exhibit—Chart gage screens and staging fixtures, scales, optical comparator

Engis Equipment Co. 915
Chicago, Ill.
To Exhibit—*Hyprez diamond compounds in pocket size units, Hyprez diamond compound laminated lapping sticks, optical alignment tools (telescopes and auto-collimator), shop and toolmakers microscopes, dividing head with projection optics, micrometer precision water level, Hyprez diamond compounds in standard units, Clinometers (vernier angle gages), precision levels

Erickson Tools Division 240
Cleveland, O.
To Exhibit—*Lever type air cylinders, which give three to four times the drawbar force of conventional air cylinders of same piston size, operating an Erickson push chuck; *full-floating holder shown on reaming and tapping operations, correcting for both parallel and angular misalignment; Speed Indexer in operation on milling machine showing automatic locking indexing for milling or machining operations

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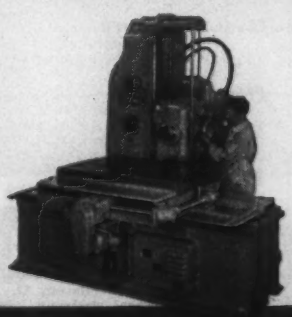
FURTHER INFORMATION

THE "JIGMIL TECHNIQUE"

OBSOLETES JIGS

for Precision Boring Operations on Small Lot Production

TYPICAL JOB TAKEN FROM OUR JIGMIL CASE HISTORY FILE



PART • Cast-Iron Gearbox.
OPERATION • Bore and Counterbore 13 Holes Ranging from 1.8505" to 2.8335". Face Two 3½" Diameter Bosses.

FLOOR TO FLOOR TIME • 75 Minutes.
TOLERANCE ON HOLE SPACING • .0005".
TOLERANCE ON BORE DIAMETERS • .0004".

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SPEED PRODUCTION AND CUT ASSEMBLY COSTS...
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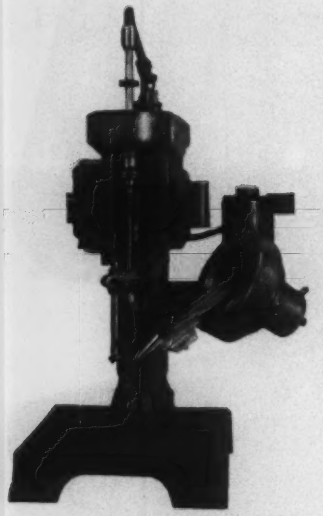
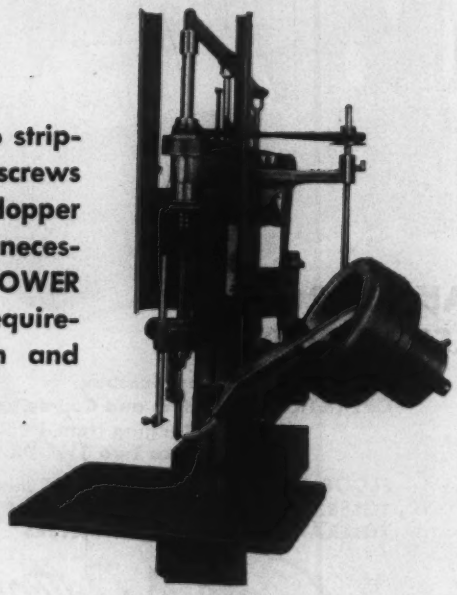


Model A—Bench Type

Thousands of manufacturers are profiting by the use of DETROIT POWER SCREWDRIVERS . . . They offer time and labor saving advantages too great to be overlooked. They will drive screws as fast as one a second! . . . . Machine, wood, brass, self-tapping sheet metal screws standard heads, special heads.

No marring of heads . . . no stripping of threads . . . all screws driven to uniform tension. Hopper fed, no handling of screws necessary. There's a DETROIT POWER SCREWDRIVER to fit your requirements, three models, bench and pedestal types.



Model B—Pedestal Type

Ask for Catalog

SEND SAMPLE ASSEMBLY FOR PRODUCTION ESTIMATE.

See Us Booth 939, A.S.T.E. Show, Philadelphia, April 10-14.

DETROIT POWER SCREWDRIVER CO. 2811 W. FORT ST. DETROIT 16, MICH.

ASTE EXPOSITION

Company	Booth No.

Errington Mechanical Laboratory Inc. 554
Staten Island, N. Y.
To Exhibit—*Fully adjustable fully geared drill head, adjustable drilling heads, adjustable tapping heads, tapping chucks, die heads, stud setters, fixed center multiple drilling and tapping heads

Ettco Tool Co. Inc. 732
Brooklyn, N. Y.
To Exhibit—*Ettco-Emrick adjustable spindle multiple drilling or tapping head; foot or air-operated tapping machine; Ettco-Emrick tapping attachments, drill and tap chucks, shanks, multiple spindle drilling and tapping heads, electric-air-operated tapping and drilling machines, electric indexing fixtures, special fixtures

Everede Tool Co. 311
Chicago, Ill.
To Exhibit — *Carbide turning tool holder equipped with mechanical chip breaker, boring bars, boring bar holders, turning tools, offset boring heads, special boring bars

Ex-Cell-O Corp. 440
Detroit, Mich.
To Exhibit—ASA standard drill jig bushings, precision grinding and boring spindles, ball bearings, aircraft and production parts; (Continental Tool Works' Division): boring bars; broaches and broaching fixtures; standard keyway broaches; counterbores and counterbore sets; ground form relieved, inserted blade milling, keyway, side milling, thread milling and tungsten carbide tipped cutters; interchangeable, high speed steel and tungsten carbide tipped core drills; thread hobs; end mills; reamers; crusher rolls; spotfacers; tap drivers; high speed steel, solid carbide and tungsten carbide tipped boring tools; combination ground circular form, ground flat form and special tools

Falcon Tool Co. 560
Detroit, Mich.
To Exhibit—*T-I drive for use with carbide tipped counterbores; high speed steel and carbide tipped end mills, reamers, counterbores, flat, circular and dovetail form tools, form relieved cutters, core drills, etc.

Federal Products Corp. 305
Providence, R. I.
To Exhibit—Dial indicators and attachments; dial indicator or mechanical gages; dimensional air gages of extremely low maintenance and extreme accuracy; electronic automatic size sorting gages; continuous measuring gages for flat or round material; automatic machine dimensional control gages; Electricator (dial indicator and signal light) electrical gages

Ferguson Machine & Tool Co. Inc. .. 651
Ferguson, Mo.
To Exhibit—High speed intermittent motion cams, electronic counters

Fidelity Tool Supply 1143
Camden, N. J.
To Exhibit—Cutting tools, diemakers' supplies

Firth Sterling Steel & Carbide Corp. 1024
McKeesport, Pa.
To Exhibit—Displays of cutting materials

Float-Lock Corp. 4
Bloomfield, N. J.
To Exhibit—*Drill press vise

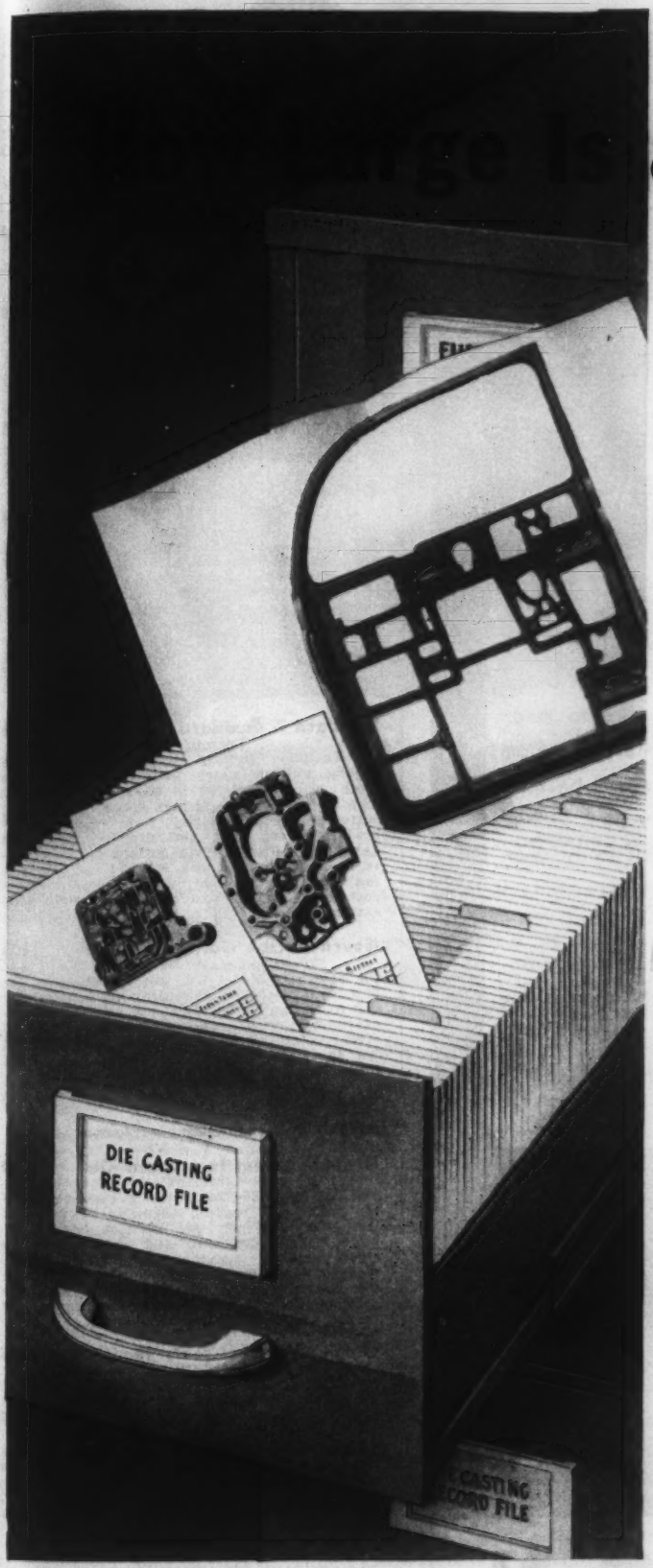
Flodar Corp. 203
Cleveland, O.
To Exhibit—Fluid Fortress no-flare fitting, Griptube flare hydraulic fitting

Foster Mfg. Co. 642
St. Louis, Mo.
To Exhibit—Quick detachable couplers

THE FOUNDRY 942

Frick Gallagher Mfg. Co. 631
Wellston, O.
To Exhibit—Steel shelving, rotating bins

Use Reply Cards on Page 153 for
FURTHER INFORMATION



a Die Casting?

?

This question has been asked frequently since our last achievement of die-casting automobile door-panels. In size this die casting is forty-three inches high; thirty-three inches wide.

So far, it is the largest aluminum die casting produced.

There is no limit within reason

New vistas ahead are as limitless as the designer dares to imagine. Our engineering and research departments are anxious to cooperate to make your imagination a reality. A phone call to one of our plants, located nearest to you, will bring immediate response.

DOEHLER-JARVIS CORPORATION

The World's Largest Producer and Finisher of Die Castings

PLANTS AT: TOLEDO, OHIO · POTTSTOWN, PA. · BATAVIA, N. Y. · GRAND RAPIDS, MICH. · CHICAGO, ILL.

EXECUTIVE OFFICES: 386 FOURTH AVENUE, NEW YORK 16, N. Y.

The Salesman:

"Johnson is not a tonnage mill. Although the Johnson line comes under a general heading of high carbon wire, there is a far wider range than that because Johnson draws wire to meet specific applications. Strict laboratory control and supervision assure the customer his own particular requirements will be met. Whether you are in the business of making bobby pins, springs or wire rope, Johnson experienced wire specialists study your problem and come up with the correct answer."

The Customer:

"That is exactly what we want here. Our application is an unusual one and we know enough about wire to realize that it requires careful research, and so we are asking you to show how Johnson meets this situation."

H. Armstrong Roberts Photo

JOHNSON
STEEL AND WIRE CO., INC.
WORCESTER 1, MASS.

NEW YORK PHILADELPHIA CLEVELAND DETROIT AKRON CHICAGO
ATLANTA HOUSTON TULSA LOS ANGELES TORONTO

ASTE EXPOSITION

Company — **Booth No.**

Gairing Tool Co. 936
Detroit, Mich.
To Exhibit — Standard and special cutting tools

Galland-Henning Mfg. Co. 844
Milwaukee, Wis.
To Exhibit—Air-hydraulic valves and cylinders

Gammons Hoaglund 31
Manchester, Conn.
To Exhibit—Helical reamers and end mills

Gardner Publications Inc. 1111
Cincinnati, O.

Gerotor May Corp. 655
Baltimore, Md.
To Exhibit—Hydraulic pumps, cylinders, valves

Giddings & Lewis Machine Tool Co. 230
Fond du Lac, Wis.
To Exhibit—*Carbide planer, *vertical boring and *turning mill tools; *high precision railroad car wheel boring tools, *inserted blade adjustable reamer, *cutter grinder, range of super micrometer stub boring tool sets

L. H. Gilmer Div., U. S. Rubber Co. 748
Philadelphia, Pa.
To Exhibit—Industrial rubber products

Goddard & Goddard Co. 1108
Detroit, Mich.
To Exhibit—*Serratip carbide inserted blade milling cutters which permit extremely fine tooth spacing, offered in sizes as small as 1 inch in diameter; solid high speed steel milling cutters; line of profile, form and inserted blade cutters; form and profile cutters and gangs; Tru-Form thread cutters, inserted cutters; line of heavy duty railroad cutters; boring tools and reamers; line of inserted blade cutters of carbide and cast alloy; solid body cutters and end mills, tipped with carbide

Govro Nelson Co. 1155
Detroit, Mich.
To Exhibit—*Model KH unit in operation, incorporating centrifugal feeding mechanism with full hydraulic control and external adjustments of rapid approach, rate of feed and length of stroke; *model HH, similar to above, but not in operation; model KT and ST tapping units

Graham Mfg. Co. Inc. 672
Ferndale, Mich.
To Exhibit—Stud welding equipment

Graham-Mintel Instrument Co. ...1044
Cleveland, O.
To Exhibit—*Electronic bench type comparator gage with reading accuracy of 0.000001-inch to 0.001-inch per division, *electronic gage block comparator and parallelism gage with reading accuracy of 0.000001 and 0.0000001-inch per division, electronic micrometer, electronic measuring snap gage, electronic hand inside gage, electronic indicator and height gage, profile recording

Great Western Tools Inc. 765
Burbank, Calif.
To Exhibit—Air feeds for punch presses

Griffith-Raguse & Co. Inc. 1112
Philadelphia, Pa.
To Exhibit—*Cone-Loc drum sander, made by American Diamond Saw Sales Co.; grinding wheels and coated abrasives of Carborundum Co.; electric tools of Black & Decker Co.; wire and tampico brushes, Capewell Mfg. Co.; industrial diamond tools, Louis Smit Co.; carbide rotary burs, made by Nicholson File Co.; cotton polishing buffs, made by National Products Mfg. Co.; sanders, made by Porter-Cable Co.; electric sanders, Detroit Surfacing Machine Co.

F. T. Griswold Mfg. Co. 562
Wayne, Pa.
To Exhibit—*OPL indexing table, OPL optical dividing head, Scan-a-Scale linear measurement control

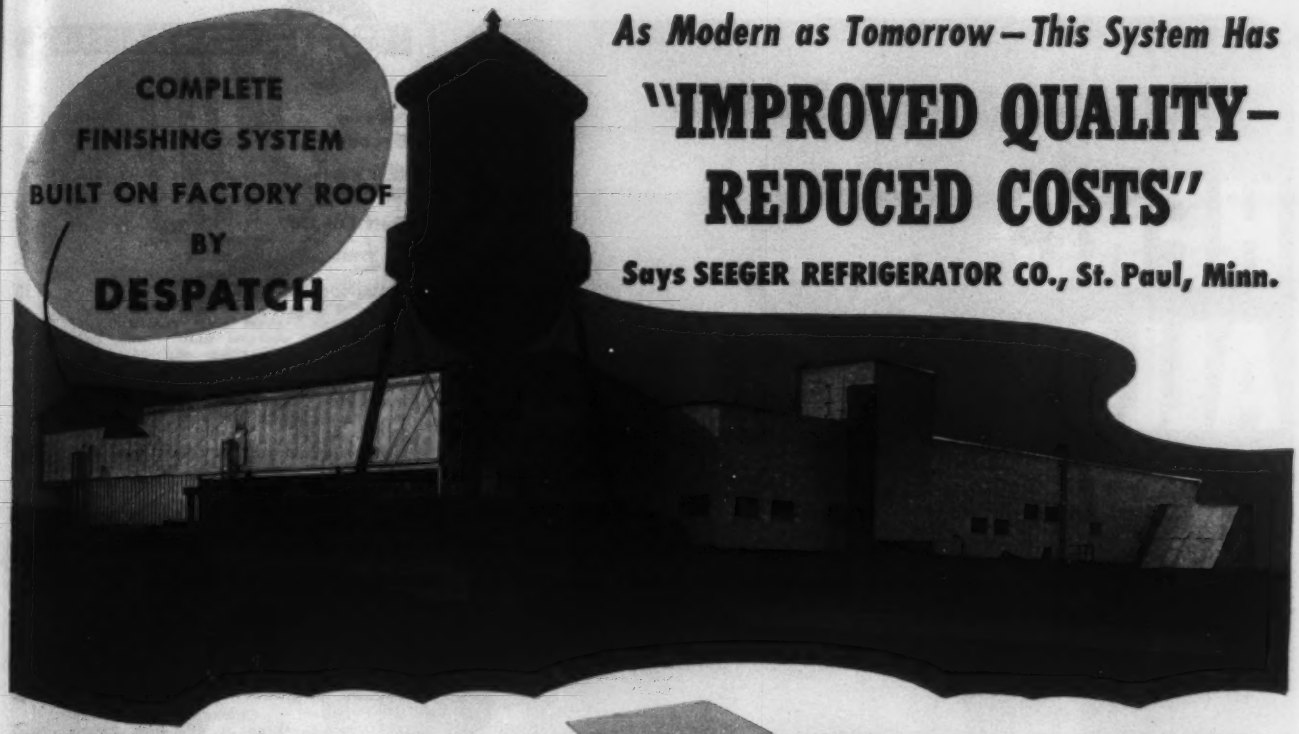
Use Reply Cards on Page 153 for
FURTHER INFORMATION

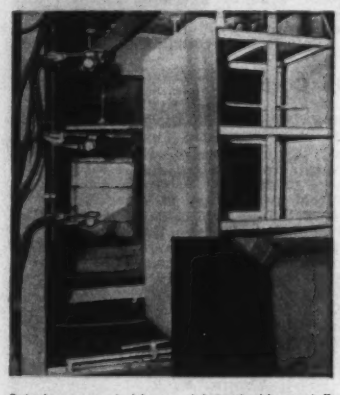
COMPLETE
FINISHING SYSTEM
BUILT ON FACTORY ROOF
BY
DESPATCH

As Modern as Tomorrow—This System Has

"IMPROVED QUALITY–REDUCED COSTS"

Says SEEGER REFRIGERATOR CO., St. Paul, Minn.





Paint losses are held to a minimum in this specially designed booth for low pressure spraying through an electrostatic field. Rear wall filters and split water curtain provide uniform air flow, preventing stratification and air turbulence. Water up to 50 gals. per minute per lineal ft. minimizes paint accumulation. Water flowing over booth floor collects overspray and carries it to settling tanks for recovery.

Equipment Clean-up and Maintenance Reduced 25%

The high standard of quality maintained by The Seeger Co., is more easily controlled by this modern finishing system designed, built and installed by Despatch. Outstanding feature of the system is electrostatic spraying in special Despatch uniform air velocity spray booths. Higher production and quality at considerable savings in labor and paint have been achieved, together with about 25% reduction in clean-up and maintenance. With conveyor operating at a normal speed of 16-ft. per minute, the plant is turning out 80 refrigerator cabinets and 30 freezers, plus parts per hour.

3500-Ft. Continuous Conveyor Operates On 4 Floors

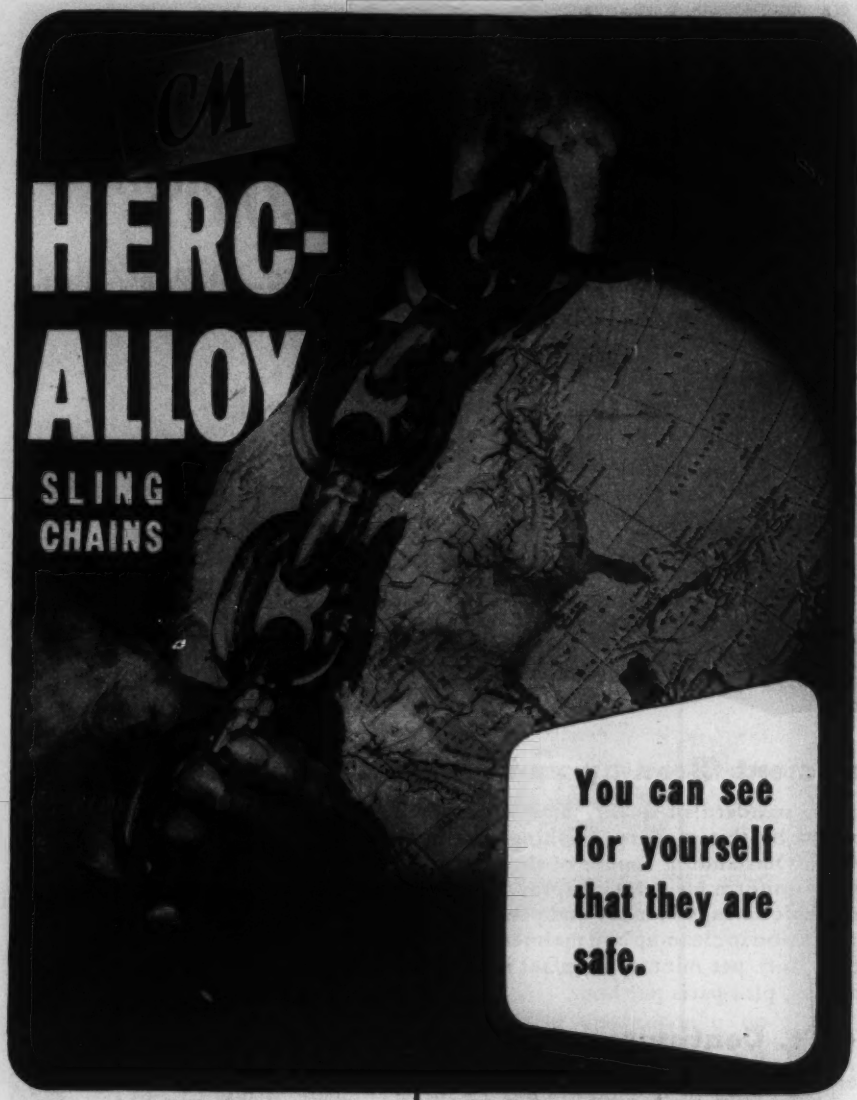
Powered by 3 Reliance drives, this chain conveyor carries ware thru 17 stations on four floors from loading zones thru initial processing units, dry-off oven, tack rag areas, spray booths, bake ovens to final inspection and freezer and refrigerator assembly lines. Among units of the system are 3 Despatch convection heated ovens for dry-off, prime coat and finish coat bake. Ovens are bottom entry-exit type making natural and effective air seals. Burners are direct fired with either gas or oil. Eight passes each in prime bake and finish bake ovens allow 30 minute baking at 350°F. and 285°F., respectively. These ovens are designed for high temperature baking of the new hard finish enamels.

Two uniform air velocity water wash booths, designed by Despatch for electrostatic spraying are employed for prime and finish coats, reducing overspray and minimizing paint accumulation. Water from these booths and two touch-up booths is piped to two 6,000-gallon settling tanks where effective paint recovery is achieved. A 5-stage fresh air make-up system comprising dry filters, steam coils for preheat, water wash spray, steam coils for reheat, and oil filter, has automatic temperature control for −20°F. to +80°F. 135,000 CFM blower distributes the filtered make-up air to the four spray booths and oven heaters. Unique engineering feature of this system is the roof installation. DESPATCH engineers are ready to meet your engineering and production problems. They will work with you on a single unit or a complete system. WRITE TODAY for Bulletin 51H or request a representative to call.

DESPATCH
OVEN COMPANY

Min[illegible]

Below: A general view of an open conveyor area with the section of the conveyor in the foreground moving left toward the metal tack rag area. The men shown are working in the prime coat sanding area which the conveyor is entering, rear center, following bake oven and 10-minute cooling pass. The partition directly back of the conveyor is that of the prime coat electrostatic booth and at the right the entrance to the pressurized prime tack rag room is shown.



● Just one of the big advantages of HERC-ALLOY Sling Chains is that you can determine their serviceability by a simple visual inspection.* Ordinary steel or iron chains, on the contrary, grow dangerously brittle with age... an insidious threat to the safety of men and materials. That's why more and more of the important companies are standardizing on HERC-ALLOY Sling Chains... because you can see for yourself that they're safe.

*Write for your copy of this new, informative booklet. No charge.

HERC-ALLOY FEATURES

- America's *first* alloy steel sling chain... first to bear a serial number.
- *Every* CM HERC-ALLOY Sling Chain is alloy steel throughout... links, rings, hooks. There is only one grade... *the best.*
- Every chain is individually tested and accompanied by a certificate of registration.
- Links are side welded for maximum strength by patented INSWELL electric method.
- HERC-ALLOY Chains should never be annealed.
- HERC-ALLOY Chains are lighter... stronger... easier to handle... outlast ordinary chains 4 to 5 times... cost less on the job.

HERC-ALLOY... the chain you can *SEE* is safe

COLUMBUS-McKINNON
CHAIN CORPORATION
Affiliated with Chisholm-Moore Hoist Corporation
GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.
SALES OFFICES: New York • Chicago • Cleveland • San Francisco • Los Angeles

ASTE EXPOSITION

Company	Booth No.

Grobet File Co. of America 1153
New York, N. Y.
To Exhibit—Swiss precision files, rotary files, countersinks

Gulf Oil Co. 615
Pittsburgh, Pa.
To Exhibit—Cutting fluids

Hamilton Mfg. Co. 713
Two Rivers, Wis.
To Exhibit—*Steel roll tracing unit, *steel three-drawer vertical unit, *steel two-drawer vertical unit including cap and base, steel five-drawer blue print unit with cap and base, wood five-drawer blue print unit with cap and base, steel wood drafting table, steel auto-shift table, ideal table, posture chair

Hammond Machinery Builders Inc. . 725
Kalamazoo, Mich.
To Exhibit—Grinding and polishing machinery

Hanchett Magnalock Corp. 1164
Big Rapids, Mich.
To Exhibit—*Magna-Vise, magnetically actuated clamps for holding nonmagnetic materials; magnetic chucks; magnetic knife bars; magnetic rotary chucks, rectangular, for grinding, milling, planing and shaping

Handy & Harman 607
New York, N. Y.
To Exhibit—High production brazing materials

Hanna Engineering Works 772
Chicago, Ill.
To Exhibit—*Line of air pilot valves, *one-way speed control valves of compact design; demonstration of ways in which fluid power can be applied for reduction of production costs.

Hannifin Corp. 215
Chicago, Ill.
To Exhibit—*Type NH hand operated and type NF foot operated valves of pilot-controlled, piston operated disk type; *type NE Directair pushbutton controlled electric valve; type P-25 hand-operated valve; type MK manifold valve (each of five types above to be connected to separate air cylinders of identical bore and stroke); *Micrometric speed control valve for air cylinders; *Air Warden air conditioning unit consisting of filter, pressure regulator and lubricator for use on all kinds of air-operated equipment; *model M-1 air-operated ½-ton Han-D-Press set up for actual operation with the new type NF foot valves; several improved hydraulic cylinders

Hardinge Bros. Inc. 701, 835
Elmira, N. Y.
To Exhibit—*Model HL tool room lathe with full bearing carriage, precision gear box for threading only, independent electric power drive for infinitely variable rate of carriage and cross slide feed; model UM universal milling machine showing matched relation of milling machine and tool room lathes; high speed precision lathe work on model DV59 precision lathe operating at spindle speeds to 4000 rpm; *model HC and *HCT chucking machines using higher spindle speed for large diameter chucking work; model AC59 second operation machine showing high speed precision finishing of small parts; model DSM59 high speed precision second operation machine featuring production threading; model AQ59 hand screw machine demonstrating high speed precision bar work; Sure-Grip and conventional master collets and pads; style B and conventional master feed fingers and pads; regular collets and feed fingers; circular form tools; circular cutoff tools; lathe collets; collet index fixtures; step chucks and nose type Hardinge-Sjogren speed collet chucks

Hauser Machine Tool Corp. 838
Manhasset, N. Y.
To Exhibit—*Type 38 jig grinding machine; *P-324 optical measuring machine; *type 241 pivot polishing machine; *type R-10 Tornos high speed automatic screw machine; type M-1, 2A3, 2BA, 4C jig boring machines; P-215 and P-216 profile projectors; P-219 profile measuring microscope; P-320 workshop measuring microscope; type 249 optical hardness tester; type 306 machine for grinding hard metal laps; Schaublin SV 70 precision toolmakers' lathe; Schaublin SV 102 high pre-

Use Reply Cards on Page 153 for
FURTHER INFORMATION

NYLON gives this New Abrasive disc-wheel *that all-important Extra*

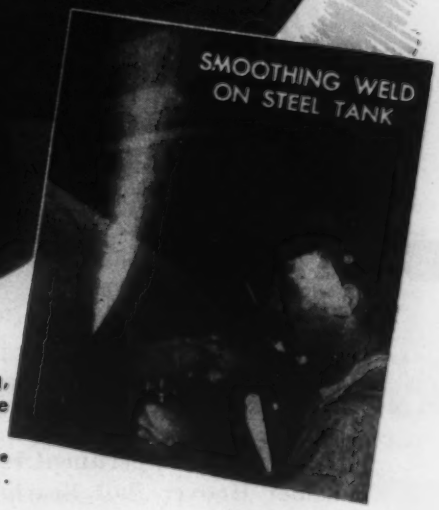
SAFE

TOUGH

DURABLE

NON-RIGID

ECONOMICAL



SAF-T-CUT

For rugged weld grinding, Saf-T-Cut disc-wheels have no superior.
(Will fit all standard right-angle head grinders and sanders . . . air or electric driven).

BAY STATE®

MEMBER OF THE GRINDING WHEEL INSTITUTE

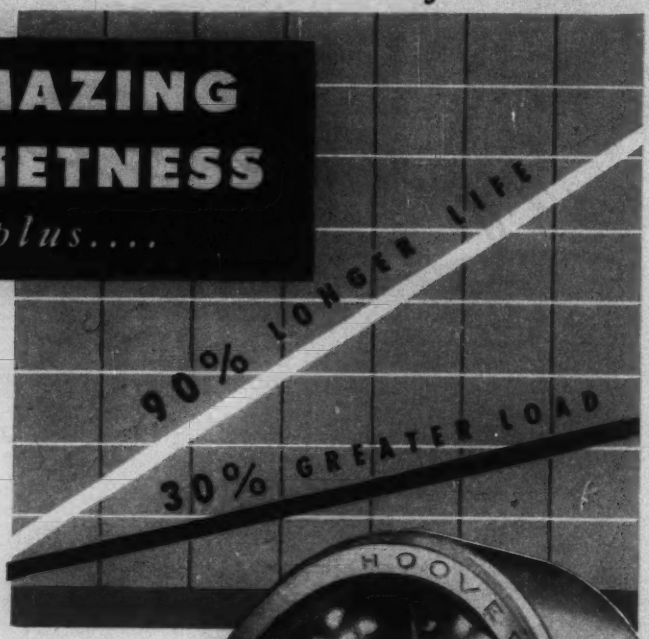
● This unique Bay State product, reinforced with strong nylon cord, is being acclaimed the "hottest" development in the abrasive field. There are definite reasons for such valued recognition when it comes to rough, heavy-duty portable jobs that must be done *FAST*. Ask for a free demonstration. You be the judge.

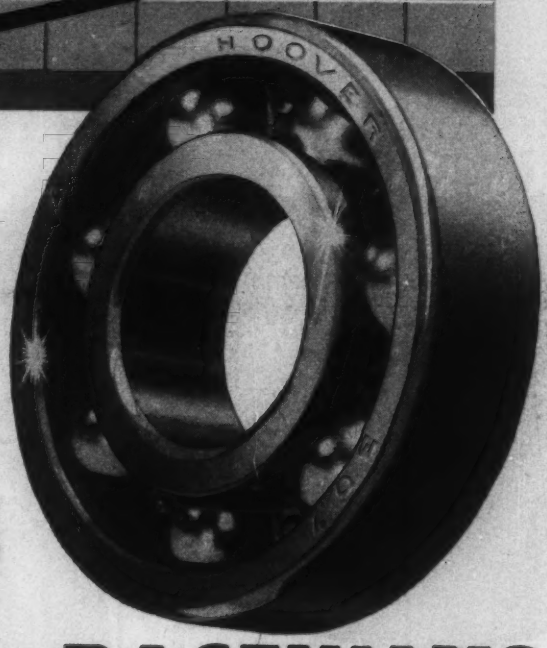
BAY STATE ABRASIVE PRODUCTS CO., Westboro, Mass.
Chicago, Cleveland, Detroit, Pittsburgh • Distributors All Principal Cities

Top Performance Consistently Duplicated

For Unexcelled Performance

AMAZING QUIETNESS *plus....*

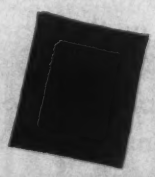




HOOVER *the* *only* **BALL BEARING** *with* **HONED RACEWAYS**

Here are three pertinent reasons why you should consider Hoover Ball Bearings — with honed raceways. First, these bearings achieve unbelievable quietness. Second, they increase bearing life 90 per cent. Third they have a 30 per cent greater load capacity. When you specify Hoover Ball Bearings you secure these PLUS features without extra cost.

The Hoover Engineering Manual gives all the facts. Write for your copy.



THE ARISTOCRAT OF BEARINGS

HOOVER BALL and BEARING CO.
Ann Arbor, Michigan

ASTE EXPOSITION

Company — **Booth No.**

cision toolmakers' lathe; Schaublin SV 12 high precision milling machine; Schaublin SV 28 machine for sharpening gun boring drills; Lambert type 75 semiautomatic gear hobbing machine; Safag No. 27 hard metal tool grinding and lapping machine; Safag No. 118 type IIA automatic wheel; pinion and segment cutting machine; Safag No. 10 automatic form cutter milling machine; Lambert No. 0 type No. 66 semiautomatic vertical gear hobbing machine.

Haynes Stellite Co. **509**
Kokomo, Ind.
To Exhibit—Cutting tools, precision castings, corrosion resistant alloys

Helm Co. **559**
Fairfield, Conn.
To Exhibit—Spherical and roller bearings, pillow blocks

Heintz Mfg. Co. **1002**
Philadelphia, Pa.
To Exhibit—Washing machine balance basket, stainless steel beer barrel, 66-inch undersink kitchen cabinet, television cabinet, television chassis, stainless Chemi-Keg, radio speaker cone, television base die, automatic dishwasher, quick-acting ship door, refrigerator evaporator, automobile fender, automobile grille, gun mount, miscellaneous stampings

Herman Stone Co. **15**
Dayton, O.
To Exhibit—Granite surface plates, straight edges and spotting plates

Hitchcock Publishing Co. **548**
Wheaton, Ill.

Huebner Publications **114**
Cleveland, O.

Hy-Air Products **951**
Jackson, Mich.
To Exhibit—Air-hydraulic presses

Hy-Pro Tool Co. **763**
New Bedford, Mass.
To Exhibit—*Multifluted special taps for plastic materials; line of special tools to be announced at show; all types of standard and special high speed steel taps

Ideal Industries Inc. **1048**
Sycamore, Ill.
To Exhibit—*Expanding lapping tool soldering tools, electric etchers

Illinois Tool Works **756**
Chicago, Ill.
To Exhibit—Tool checking machines, metal cutting tools

Index Machine Co. **1115**
Jackson, Mich.
To Exhibit—High speed vertical and horizontal milling machines, precision index rotary tables

Industrial Diamond Association ... **1071**
New York, N. Y.
To Exhibit—*Animated hardness chart indicating relative hardness of diamond as compared with that of abrasive next in hardness; panel on which are practically all types of diamond tools and parts which they process, and consumer end products; display of industrial diamonds of all types as mined

Industrial Press **101**
New York, N. Y.

Industrial Scientific Co. **34**
New York, N. Y.
To Exhibit—Automatic contour measuring instrument

Ingersoll Milling Machine Co. ... **950**
Rockford, Ill.
To Exhibit—*Close-bladed carbide tipped shear clear face mills for feed rates milling cast iron up to 90 inches per minute; *cylinder boring tools with about twice the number of carbide tipped blades for improving tool life; *developments in inserted blade helical cutters; inserted blade milling and boring cutters, in-

Use Reply Cards on Page 153 for
FURTHER INFORMATION

Company — Booth No.

cluding: Face mills, end mills, half side mills, staggered tooth slotting cutters, slab mills, cylinder boring tools, and special tools with high speed steel and carbide-tipped blades

Institute of Industrial Launderers . 552
New York, N. Y.
To Exhibit—Uniforms, laundry equipment

J & S Tool Co. Inc. 954
East Orange, N. J.
To Exhibit—Cylindrical grinding machines

Jacobs Mfg. Co. 671
Hartford, Conn.
To Exhibit—*Spindle-nose collet chuck, drill and tap chucks

Janney Cylinder Co. 1036
Philadelphia, Pa.
To Exhibit—Precision castings in ferrous and nonferrous metals

Charles L. Jarvis Co. 807
Middletown, Conn.
To Exhibit—*Multi-Tappers, *precision machine-ground tungsten carbide rotary files, solid carbide reamers, solid carbide end mills, solid carbide knurls, solid carbide boring bits, flexible shaft machines, Torqomatic tapping attachments, Tecni-Taps, ground-from-the-solid rotary files in high speed steel and tungsten carbide

Jergens Tool Specialty Co. 112
Cleveland, O.
To Exhibit—*Sine fixture key with ⅝-inch diameter shank for all keys up to and including 13/16-inch which does away with milling or shaping of a slot in bottom of fixture base; standardized ⅝-inch hole on all fixtures makes them interchangeable on any machine table with use of the fixture key; close jig boring work is done from one side and in one setting. Line of jig and fixture accessories such as chuck jaws, hand knobs, thumb screws, hand wheels, etc.; open end wrenches and thread restorers; T-set kits

Johnson Gage Co. 1051
Bloomfield, Conn.
To Exhibit—*Screw thread gaging and measuring equipment, gages

Jones & Lamson Machine Co. 831
Springfield, Vt.
To Exhibit—Line of optical comparators and accessories, line of automatic opening die heads and chasers

Kalamazoo Tank & Silo Co., Machine Tool Division 1012
Kalamazoo, Mich.
To Exhibit—Model 816 C metal cutting band saw; model 610 S metal cutting band saw

Kaufman Mfg. Co. 1120
Manitowoc, Wis.
To Exhibit—Special machinery

Kellerflex Div., Niles-Bement-Pond Co. 632
West Hartford, Conn.
To Exhibit—*Kellerflex Di-Bur with diamond fluting which produces granular chips, for cutting the toughest die steel; *Diaform wheel forming attachment for form dressing wheels to "tenth" accuracy; Kellerflex flexible shaft machines and accessories, Keller high speed steel and carbide master ground center-fluted burs (also see Pratt & Whitney Division, Booth 815)

Kennametal Inc. 914
Latrobe, Pa.
To Exhibit—*Kentanium high temperature titanium alloy; mechanical units in which typical machining jobs are demonstrated on actual workpieces with tools in cutting position; tools display includes clamped-on tools, H-type and Kennamatics, conventional brazed tools, Kennamills, wear resistant parts, balls for hole sizing, strip mill rolls, disk files, saws for wood and plastics, router bits

Lassy Tool Co. 556
Plainville, Conn.
To Exhibit—Hand tapping machine, threading

Use Reply Cards on Page 153 for
FURTHER INFORMATION

It No Longer Requires a Calculating Machine and Two Small Boys to Figure Abrasive Prices!

Buyers of surface-coated abrasives will enjoy this *Simplified Pricing* by *Michigan* ABRASIVE CO.

- ABRASIVE BELTS
- ABRASIVE ROLLS
- ABRASIVE DISCS
- ABRASIVE SHEETS
- LAPPING COMPOUNDS

Those of you who have "sweat it out" figuring chain discounts on surface-coated abrasives will enjoy the simplified pricing provided by the Michigan Abrasive Company. It makes the figuring of costs simple, easy and time saving. It makes it easier to buy.

This convenient step in pricing from the customer standpoint exemplifies the progressiveness of this comparatively new company (8 years), where you'll find advance manufacturing methods turning out quality products.

Today many of the largest companies in the automotive and industrial field are users of Michigan Red Coat Brand Abrasives. You'll find that these sharp-cutting, long-lived abrasives can turn out the work and give you the "mileage" that reduces production costs.

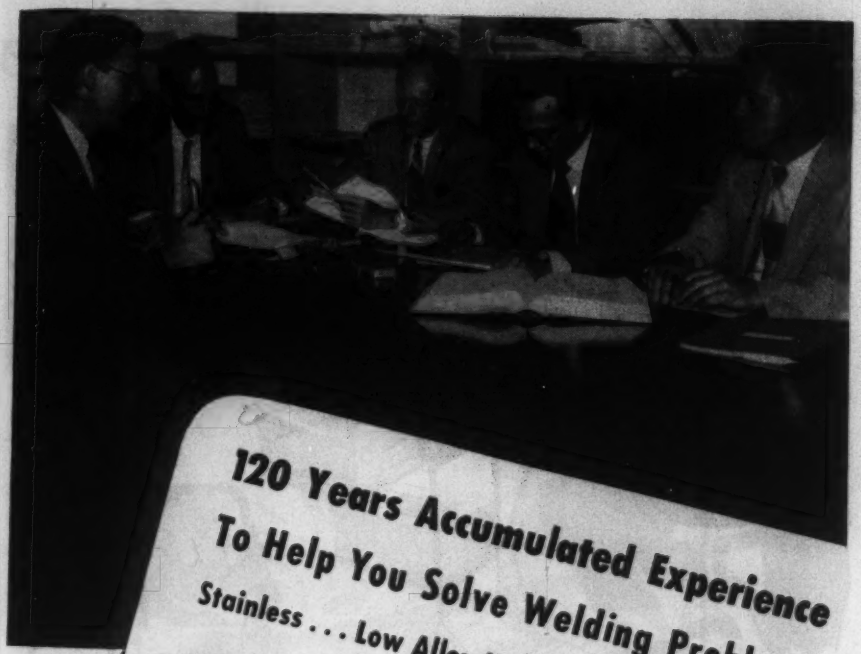
But to prove this important point, send for a simplified price list and specify Michigan Red Coat Brand Abrasives the next time you order from your distributors.

Simplified ABRASIVE PRICE LIST Is Yours for the Asking
Ask Your Distributor or Write Direct

SOLD THROUGH DISTRIBUTORS

Michigan RED COAT BRAND ABRASIVES

MICHIGAN ABRASIVE COMPANY, 2360 W. Jefferson Ave., Detroit 16, Michigan



120 Years Accumulated Experience To Help You Solve Welding Problems

Stainless . . . Low Alloy High Tensile . . . Non-Ferrous

Here's a picture of Arcos welding experience at work—the technical staff in a huddle over a customer's problem. They can answer more than "What electrode should I use?" Typical of the questions they answer every day are . . . "What cooling rate do you use when welding 7% chrome pipe?" "What electrode do you use for welds when operating temperatures are -40° F.? -150° F.? -320° F.?

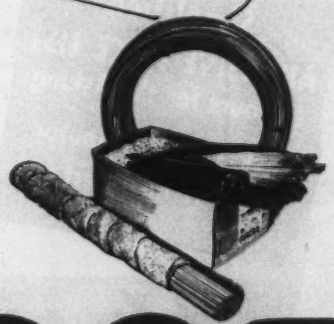
Arcos engineers know the importance of uniformity in electrode manufacture for consistently good welding results. The many rigid production quality controls assure consistently high quality weld metal.

On that tough welding job, try Arcos electrodes and measure your savings in less rewelding. Available from nearby distributor stocks in all standard types and sizes.

ARCOS CORPORATION

1500 South Fiftieth St., Philadelphia 43, Penna.

WELD WITH ARCOS



Specialists in Stainless, Hydrogen Controlled, and Non-Ferrous Electrodes.

ASTE EXPOSITION

Company — **Booth No.**

and tapping equipment, precision angle irons, V-block work holders

Last Word Sales Engineering 1161
Royal Oak, Mich.
To Exhibit—Emery wheel dressers

Latrobe Electric Steel Co. 808
Latrobe, Pa.
To Exhibit—*BR-4 abrasion resistant die steel containing vanadium carbides, desegatized high speed steels and high carbon-high chromium die steels, tool steels

K. O. Lee Co. 566
Aberdeen, S. D.
To Exhibit—*B-800 series tool and cutter grinders, *B-800 series carbide tool grinders, *keyless thread chuck, *tool post and thread grinder, expanding mandrels, keyless drill chucks, hone and reamer drive, abrasive wheel dressers, chuck centers, portable electric drills, sanders and polishers

Link Belt Co. 721
Chicago, Ill.
To Exhibit—Enclosed gear drives, variable speed transmissions

Lipe-Rollway Corp. 115
Syracuse, N. Y.
To Exhibit—*Lipe fully automatic magazine loading bar feed, Hand-I-Hack portable power hack saw machine, standard Lipe pneumatic bar feed

F. J. Littell Machine Co. 622
Chicago, Ill.
To Exhibit—Punch press with roll feed

Livingstone Engineering Co. 11
Worcester, Mass.
To Exhibit—*Speedylectric 1½ hp Speedytherm boiler for molding, laminating, cleaning, etc.; capable of providing mold and platen temperatures up to 470° F.; electric input in continual balance with steam load. *Speedylectric steam-spray unit for spray painting; saves in number of coats and amount of thinner required; provides smooth surface with minimum waste and drying time. Speedylectric steam-jet cleaner JC-30 in operation showing paint can be stripped and machinery cleaned; 98 per cent efficient; automatic balanced control reduces operating expense. Speedyvent for reducing heating time in closed systems by venting air while water and steam remain in system; available for steam pressures up to 600 psi

Logan Engineering Co. 1045
Chicago, Ill.
To Exhibit—*Model 955 Q. C. pedestal base lathe, model 400 lathe, model 825 lathe, model 945-2 turret lathe, model ES8-S 8-inch shaper

Logansport Machine Co. Inc. 707
Logansport, Ind.
To Exhibit—*Redesigned model 600 RFL unit; *line of two, three and four-way air control valves; air and hydraulic valves and cylinders; airdraulic cylinders; hydraulic power units; air presses; centrifugal pumps

Lovejoy Tool Co. Inc. 646
Springfield, Vt.
To Exhibit—*Inserted tool milling cutter for slotting and side milling, blades of which are standard carbide blanks held in the body with a taper wedge; because of small dimension of wedges and blades, many blades may be inserted in body even on small diameter cutters; design allows extremely narrow cutters to be used

Lufkin Rule Co. 508
Saginaw, Mich.
To Exhibit—*Inside, outside and depth micrometers with reading surfaces in chrome clad finish; *Mesurall and *Wizard Jr. tape rules with chrome clad finish; line of measuring tapes, rules and precision tools

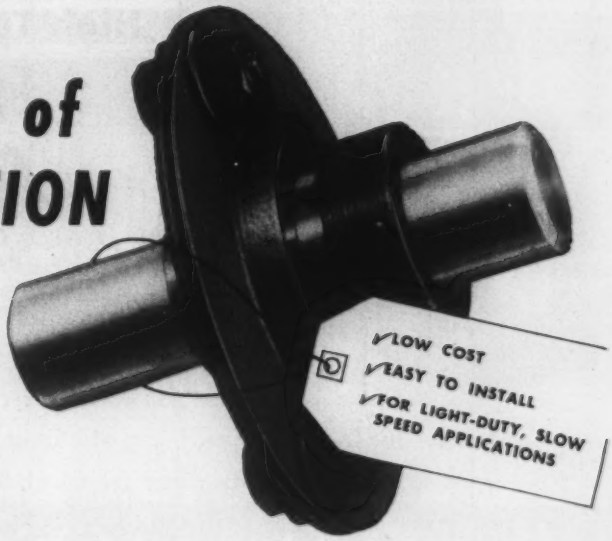
Edward A. Lynch Machinery Co. 1072
Wynnewood, Pa.
To Exhibit—No. 8L10 Chicago steel power press brake, made by Dreis & Krump Mfg. Co., Chicago, for forming, bending, notching, punching, etc., of mild steel, stainless, and

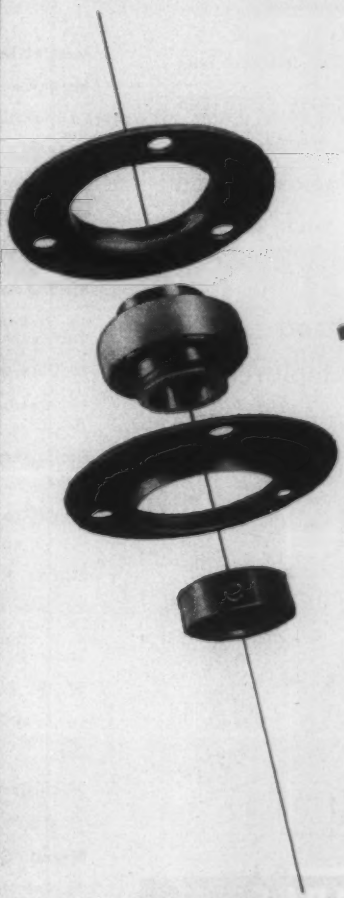
Use Reply Cards on Page 153 for **FURTHER INFORMATION**

EASY TO INSTALL
NO COSTLY MACHINING
1 Provide holes in machine frame to accommodate flange cup and flange mounting bolts.
2 Slip one half of flange, with cup side facing assembler, over shaft.
3 Slide bearing and collar on shaft.
4 Slip other flange over shaft with cup side toward bearing.
5 Line up bolt holes of flanges with bolt holes on machine, slide bearing into proper position and bolt unit in place. DO NOT TIGHTEN BOLTS.
6 Repeat for other end of shaft and then tighten bolts on both ends.
7 Engage locking collar by turning in direction of shaft rotation until one in collar drops over cam on inner ring. Continue turning until cams lock. Tighten set screw.

Now you can equip your machines with ball bearings at *NEW LOW COST*

. . . with *NEW EASE of INSTALLATION*





The Fafnir Flangette

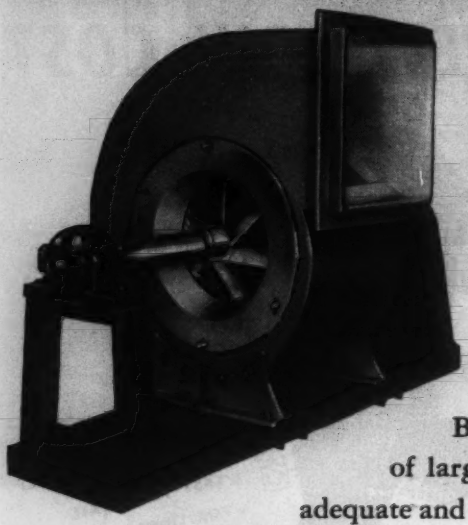
incorporating the famous Fafnir Wide Inner Ring Ball Bearing with Self-Locking Collar

Now you can add ball bearing performance, power economy and longer bearing life to your equipment within your cost limits. A brand new, simple, low cost housing idea eliminates costly machining, makes maintenance easier. A pair of pressed steel flanges which can be bolted anywhere on your machine, provides a lightweight, compact, sturdy housing for a standard Fafnir Wide Inner Ring Ball Bearing. Curved contour of inside surface of flanges matches curving contour of bearing outer ring to provide full self-alignment when installing the unit. A twist of the collar locks bearing to shaft. Sealed both sides with Fafnir Mechani-Seals . . . a labyrinth design of interlocking steel plates. Write today for illustrated folder. The Fafnir Bearing Company, New Britain, Conn.

FAFNIR
BALL BEARINGS

MOST COMPLETE LINE IN AMERICA

FOR IMPROVED AND FASTER RADIANT CONVECTION ANNEALING



MICHIANA
High Temperature FANS

MP CORP.

Better and faster annealing of larger diameter coils requires adequate and correct circulation of gases to augment the radiant heat . . . Michiana Fans designed for high-temperature application are ideal for such annealing processes.

Michiana Heat-Resistant Alloys Used

For all vital parts, heat-resistant alloys are employed for long-life economical service. The unusual design eliminates all bolts, rivets, screws and welds, allows for expansion and contraction, and prevents distortion and unbalancing of fan wheel.

Michiana can help save your time, and experienced engineers are ready to cooperate with you. Why not let us work with you now,—or write for Fan Bulletin 645.

MICHIANA PRODUCTS CORPORATION
Michigan City, Indiana

MICHIANA RADIANT TUBES

Into the production of Michiana Radiant Tubes there is a background of over 30 years of specialized experience in heat-resistant Alloy Castings . . . Let us give you complete information on radiant tubes covering your requirements. Ask for Alloy Casting Booklet 111.

ASTE EXPOSITION

Company — **Booth No.**

aluminum sheet metals and plate; No. 1036 Hi-Speed shear, made by Libert Machine Co., Green Bay, Wis., for shearing of irregular shapes in sheet metal up to 10-gage mild steel or 12-gage stainless, offered with 30, 36 and 60-inch throat depths; Model R-3-L initial pinch type plate bending roll, made by Webb Corp., Webb City, Mo., for rolling mild and stainless steels and aluminum alloy sheets and plates into cylinders, half cylinders, elliptical shapes and cones; No. 47 Steelworker combination punch, shear and coper, made by Webb Corp., for use on angles, T's, plates, bars and structurals; No. 48-L Quickwork-Whiting stamping trimmer, made by Whiting Corp. Quickwork Division, Harvey, Ill., for trimming flash from almost any type of stamping in a single plane as well as handling, beading and forming operations in the same or separate passes.

M-B Products Co. **642**
Detroit, Mich.
To Exhibit—Pneumatic grinders, air tool lubricators

MACHINE DESIGN **942**

Macklin Co. **943**
Jackson, Mich.
To Exhibit—Grinding wheels

Madison Mfg. Co. **513**
Muskegon, Mich.
To Exhibit—Tools, fixtures

Magnaflux Corp. **563**
Chicago, Ill.
To Exhibit—Nondestructive testing equipment

Martindale Electric Co. **1147**
Cleveland, O.
To Exhibit—Rotary files and burrs, saws, flexible shaft grinders, maintenance tools

Marvin Machine Products Inc. **1010**
Detroit, Mich.
To Exhibit—Bench milling machine attachments

McCaskey Register Co. **551**
Alliance, O.
To Exhibit—Procedure control forms

McGraw-Hill Publishing Co. **416**
New York, N. Y.

Metal Removal Co. **1160**
Chicago, Ill.
To Exhibit—*Roto-Master carbide grinder, *Master carbide burrs, *Master Hi-Speed burrs, porcelain bonded mounted wheel, die finishing specialties.

W. F. Meyers Co. **22**
Bedford, Ind.
To Exhibit—*Meyco carbide-inserted drill jig bushings, *Meyco Vibra-Free carbide tipped saws

Michigan Tool Co. **1017**
Detroit, Mich.
To Exhibit—Standard gear production tools

Micro Switch Div. **557**
Freeport, Ill.
To Exhibit—Electrical control equipment

Miller Motor Co. **735**
Chicago, Ill.
To Exhibit—*Fluid pressure boosters which develop up to 10,000 psi hydraulic working fluid pressures from ordinary plain air or hydraulic input pressure; *hydraulically controlled air power; air cylinders; high pressure hydraulic cylinders; safety air hoists

A. Milne & Co. **405**
New York, N. Y.
To Exhibit—Steel supplies

Milton Equipment Co. **619**
Philadelphia, Pa.
To Exhibit—Products of W. A. Whitney Mfg. Co., Rockford, Ill., Dreis & Krump Mfg. Co., Chicago, Ill., Service Machine Co., Chicago, Ill., Peck, Stow & Wilcox Co., Southington, Conn., Famco Machine Co., Racine, Wis.

Use Reply Cards on Page 153 for
FURTHER INFORMATION

A GOOD hammer gang always works better with the rugged, dependable Erie Hammer on the team. On Erie Hammers all stressed parts, upper works, frames and anvils are steel.

Write for bulletins on Erie Steam or Air, Board Drop, Single and Double Frame Forging Hammers and Motor Driven Pneumatics.

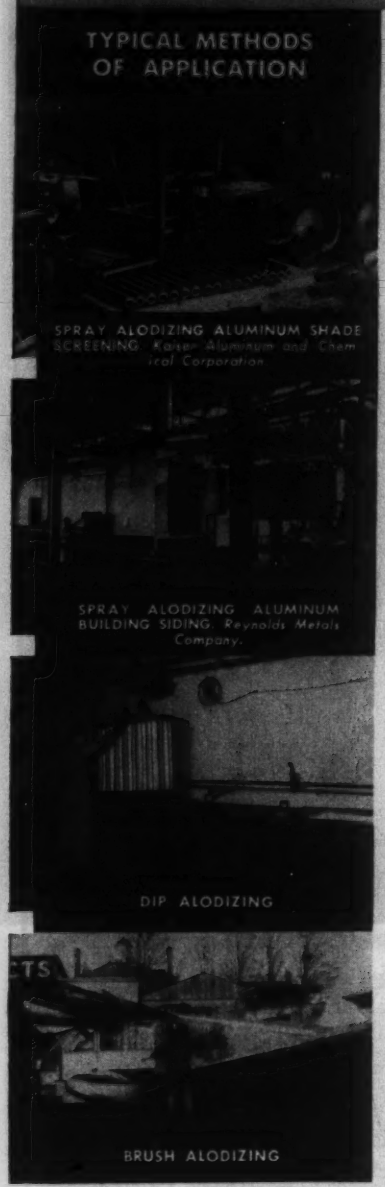
ERIE

ERIE FOUNDRY COMPANY • Erie, Pa., U.S.A.

ERIE BUILDS *Dependable* HAMMERS

Alodine

BONDS PAINT TO ALUMINUM AND PROTECTS THE METAL


TYPICAL METHODS OF APPLICATION
SPRAY ALODIZING ALUMINUM SHADE SCREENING. Kaiser Aluminum and Chemical Corporation
SPRAY ALODIZING ALUMINUM BUILDING SIDING. Reynolds Metals Company.
DIP ALODIZING
BRUSH ALODIZING

EFFECTIVE. Alodized aluminum anchors the paint finish with a tough, durable bond; and greatly increases the metal's natural resistance to corrosion. "Alodine" qualifies under Specification AN-C-170 (Chemical Films for Aluminum and Aluminum Alloys).

ECONOMICAL. Alodizing is low in chemical and equipment cost. Short processing cycle and low temperature minimize tank size and heat requirements.

ELECTROLESS. Alodizing with "Alodine" is a chemical conversion process and requires no plating equipment or current.

EASY TO USE. Operating procedure is simple and the coating process is practically foolproof. Application is extremely flexible — with dip, spray, brush and flow coat processes to choose from.

Reynolds Metals Company *and* **Kaiser Aluminum and Chemical Corporation** *are now producing Alodized aluminum coil and sheets, and such typical products as Alodized aluminum siding and shade screening.*

SPECIFY *"Alodine"* AND *Alodized aluminum* FOR PRODUCT AND FINISH DURABILITY.

Write us for process details.

Pioneering Research and Development Since 1914

AMERICAN CHEMICAL PAINT COMPANY

AMBLER, PA.

Manufacturers of Metallurgical, Agricultural and Pharmaceutical Chemicals

ASTE EXPOSITION

Company — **Booth No.**

Modern Industrial Engineering Co. 30
Detroit, Mich.
To Exhibit—*Burr-Master gear and spline internal and external burring and chamfering machines

Modernair Corp. 957
Oakland, Calif
To Exhibit—*Expanded line of CV series valves, which offers nearly 280 valve combinations using a basic body casting in ⅜-inch and ½-inch pipe sizes; virtually all 14 basic valve models, i.e., hand, foot, cam, pilot pressure or secondary valve operated valves, may be used in combination with 17 different left end attachments, i.e., roller cam, foot pedal or palm button return. Control valves for air and hydraulic circuits; air-operated machine tool feeding units; nonrotating cylinders for air and hydraulic circuits; air presses; air collet closing fixtures; air-operated hydraulic pumping units; quick exhausting valves

Montgomery & Co. 1053
New York, N. Y.
To Exhibit—*Combination dividing head, radius dresser, angle dresser and indexing fixture; *magnifying and inspection tools; self-centering drill press turret; magnetic indicator stand; jig grinding attachment for machine tools

Moore Products Co. 301
Philadelphia, Pa.
To Exhibit—*Pneumatic precision relay for automatic gaging and machine tool control applications, *bracket-mounted air gage unit, pneumatic comparators, gages for measurement of inside and outside diameters, thickness, etc.

Moore Special Tool Co. Inc. 1007
Bridgeport, Conn.
To Exhibit—*Model 2 jig grinder, model 2 jig borer, Panto-Crush wheel dresser, motorized centers, line of hole location accessories

Morton Machine Works 437
Ferndale, Mich.
To Exhibit—Fixture clamps, standard fixture parts

Mueller Engineering Co. 639
Dearborn, Mich.
To Exhibit—*100-ton hydraulic perforating press, operating at 10,000 psi working pressure, with punches made by company; self-sealing high pressure fluid connectors; high and low pressure selector valve with decompression feature, 10,000 psi intensifier. Automatic hydraulic stripping perforating units installed on above press; demonstrated punching of holes through 1½-inch thick steel plates.

National Broach & Machine Co. 601
Detroit, Mich.
To Exhibit—*Model GSD-14-inch alternating/direct current internal - external - planetary gear sound tester; *model GRC-12-inch gear wobble checking fixture; *model LCE gear lead comparator; model GSC-10-inch gear sound tester; model LCB-ICB—12-inch gear checker for lead and index; model SIC-CPA-12-inch gear checker for helix angle and parallel; model GRB gear hand rolling fixture; involute broaches for internal gears; gear shaving cutters

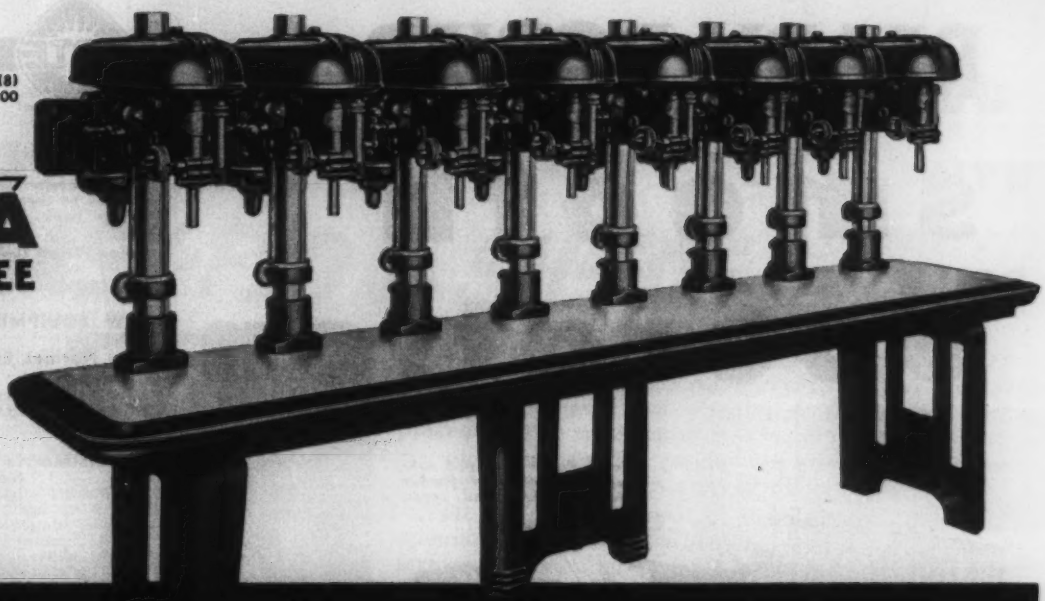
National Jet Co. 1162
Cumberland, Md.
To Exhibit—Drilling machines

National Tool Co. 760
Cleveland, O.
To Exhibit—*Pocket comparator, an optical measuring device; special cutting tools, including gear and spline hobs, gear shaper cutters, herringbone gear cutters, master gears, plain and side milling cutters, form relieved and profile ground cutters, broaches, counterbores, reamers, end mills, gang cutters, flat, dovetail and circular form tools

National Tool Salvage Co. 1140
Detroit, Mich.
To Exhibit—*NTS Center drill for hardened

Use Reply Cards on Page 153 for **FURTHER INFORMATION**

17" Multiple-Spindle (8) Drill Press - $1579.00



DELTA
MILWAUKEE
®

17" Floor-Model Drill Press $172.00

Single-spindle drill presses ...or batteries a block long!

14" Floor-Model Drill Press $109.00

14" Bench-Model Drill Press $74.00

14" Super-Hi® Drill Press $151.50

17" Floor-Model Power-Feed Drill Press $267.00

17" Bench-Model Drill Press $204.50

Motor and switch extra. Prices subject to change without notice.

TALK about selection! There are 144 different drill presses in the big Delta line. Every one is tops when it comes to drilling — and versatile enough to do over 36 different additional jobs, besides!

Naturally you can find the exact machine your job calls for in such a complete line — with the right number of spindles, the right chuck capacity, the right speed — *and at the right cost!*

There are 14" and 17" models . . . floor and bench types . . . single spindles . . . multiple-spindle batteries . . . individual heads for special set-ups . . . power-feed and foot-feed machines . . . high-speed, super-sensitive models. Speeds range from 80 to 12,000 r.p.m. . . . capacities from .023" diameter to ¾" in cast iron. And, as you know, Delta quality is always the best.

What's more, you get this *same* wide selection in 42 other machines besides drill presses. Altogether, they make *Delta* the industry's most complete line of metalworking and woodworking machines. It's the only line with complete accessories to make every tool do more jobs — and often save you an investment in other machines.

That's why it pays to look to Delta first — for the right machine to do your job right. Send coupon for catalogs and bulletins on the entire Delta line.

POWER TOOL DIVISION
Rockwell
Manufacturing Company
MILWAUKEE 1, WISCONSIN

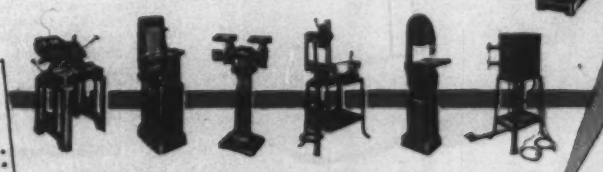
DELTA • MULTIPLEX • CRESCENT • HOMECRAFT

Sold only through authorized dealers. Easy time-payments!

Look for the name of your Delta dealer under "Tools" in the classified section of your telephone directory.

Tear out coupon and mail today!

Plus a complete selection of:



3 Cut-Off Machines · 2 Abrasive Finishers · 5 Grinders · Deburring Machine · 3 Band Saws · 3 Welders

6 Circular Saws . . . 4 Jointers . . . Scroll Saw . . . 4 Radial Arm Saws . . . 2 Shapers . . . 2 Saw-Jointer Combinations . . . Mortiser . . . Lathe . . . 2 Buffing Machines . . . 2 Planers.

53 Machines — 246 Varieties

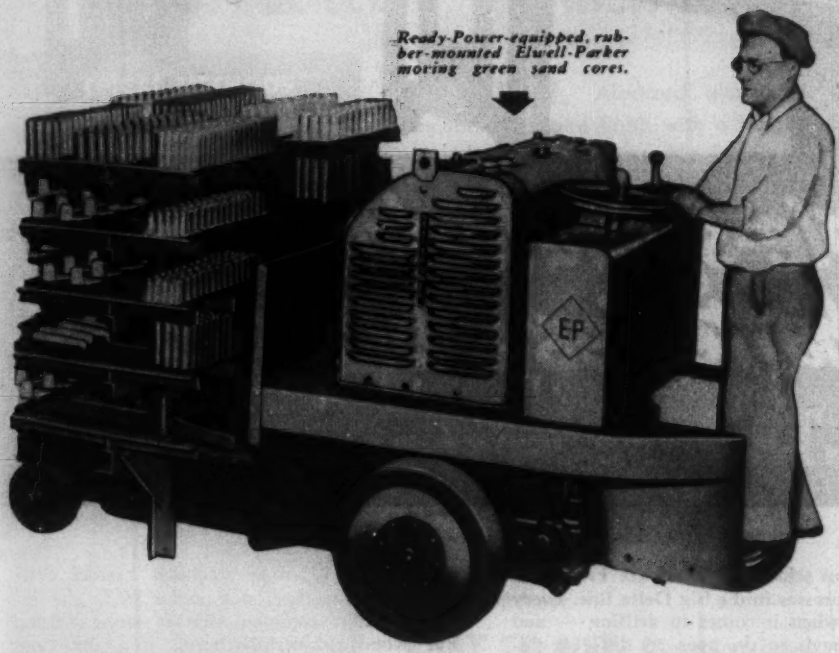
Power Tool Division
ROCKWELL MANUFACTURING CO.
628D E. Vienna Ave., Milwaukee 1, Wis.

Send me free catalogs and bulletins on the complete Delta line.

Name.....
Title.....
Company.....
Address.....
City.....(.....) State.....

M-47

READY-POWER for smooth operation



Ready-Power-equipped, rubber-mounted Elwell-Parker moving green sand cores.

If it's smooth, electric truck operation you want, there's nothing better than Ready-Power gas-electric Power Units. Ready-Power offers *more* than regular electric truck operation because dependable electric current is generated right on the truck chassis in unlimited amounts. That means trucks are always ready to operate at top efficiency . . . 'round the clock if necessary. Install Ready-Power Units on any make electric truck. Write for details.

Ready-Power-equipped Mercury truck loading an annealing oven.

THE READY-POWER CO.

3824 Grand River Ave., Detroit 8, Michigan

ASTE EXPOSITION

Company — **Booth No.**

steel, used when necessary to drill new centers on tools that have been ground off or where centers are worn; NTS carbide drill; samples of reconditioned high speed steel and carbide tools

Nelco Tool Co, Inc. 561
Manchester, Conn.
To Exhibit—Cutting tools

NEW EQUIPMENT DIGEST 942

New Hermes Engraving & Machine Corp. 25
New York, N. Y.
To Exhibit—Portable and bench type engraving machines

Nichols-Morris Corp. 931
New York, N. Y.
To Exhibit—*Nichols Twin-Mill miller for variety of light duty production milling operations, standard Nichols miller, production Nichols miller with airfeed, tool room Nichols miller

Nife Inc. 12
New York, N. Y.
To Exhibit—Universal tool grinder, drill press

Nilsson Gage Co. Inc 1151
Poughkeepsie, N. Y.
To Exhibit—Line of six Nilco dial bore gages covering range of ⅝ to 12 inches with indicator graduations of 0.0001-inch supplied as standard; same indicator can be used with complete range, or any other type graduation of American gage design standard class can be substituted; employs three-point alignment and two-point gaging. Nilco dial snap gage with framework machines from rolled magnesium with angles at 45 degrees for maximum rigidity and to minimize dimensional changes caused by temperature; features a vernier adjusting screw which permits ¼-inch adjustments to be made in gaging pin or movable anvil

C. A. Norgren Co. 635
Denver, Colo.
To Exhibit—*Reversible lubricator, *filter-regulator unit, Lubro-Control units (filter-regulator-lubricator), spindle lubricator, reversible lubricator, air filters, pressure regulators, filter-regulator unit, relief valves, air governors, needle valves, hose couplings, hose assemblies, blow gun

Norton Co. 409
Worcester, Mass.
To Exhibit—*32 Alundum wheel in operation on a 16 x 2-inch face milling cutter to demonstrate faster, cooler cutting action; *Norflex cutoff and sanding type wheels of reinforced construction in operation on portable grinders showing fast cutting, durability and resistance to breaking in grinding down welds, cleaning and smoothing castings, etc.; *ceramic surface plate; Norbide boron carbide dressing sticks and parts for wear resistant applications; grinding wheels

Oakite Products Inc. 565
New York, N. Y.
To Exhibit—*Compound No. 33, an acid type cleaner and surface conditioner for ferrous metals and aluminum; *composition No. 38 for forming a dense foam-blanket on pickling solutions to prevent escape of acid fumes; composition No. 91 and 91-A, used together for electrocleaning of brass and copper; composition No. 90 electro-cleaner for steel; composition No. 97 emulsifiable solvent for use in automatic washing machines to preclean steel, cast iron, brass, aluminum and zinc before electroplating or prepaint treatment or between processing operations; pickle control No. 3 inhibitor for pickling solutions that prevents waste of acid after scale or rust is dissolved; compound No. 36 acidic cleaner for tank-conditioning of metals for paint; Crys-Coat No. 87 prepaint conditioning of iron, steel, zinc, aluminum and copper alloys in mechanical washing machines

Ohio Crankshaft Co., Tocco Div. . . 205
Cleveland, O.
To Exhibit—Induction heating equipment

Use Reply Cards on Page 153 for
FURTHER INFORMATION

GET ANY PRODUCTION YOU NEED AT SURPRISINGLY LOW COST WITH EASY-FLO AND SIL-FOS BRAZING

The EASY-FLO and SIL-FOS alloys make torch brazing so easy that unskilled operators — men and women — can give you fast production of top-quality joints after only a few hours training.

LOW-TEMPERATURE EASY-FLO AND SIL-FOS SILVER ALLOY BRAZING is so extremely simple, so fast and so versatile that it is *just naturally a low-cost process.* For the same reasons it is readily adapted to give you any metal joining production you need, whether it's only a hundred parts a day or thousands.

You can get the benefit of the inherent speed and economy of the process whether you join ferrous, nonferrous or dissimilar metals—because EASY-FLO and SIL-FOS alloys join them all. What's more you can be sure of joints that are—exceptionally strong and ductile—liquid and gas tight—high in electrical and heat conductivity — resistant to corrosion — because every properly made EASY-FLO and SIL-FOS alloy joint *has all of these properties.*

The cases illustrated, typify the ready adaptability of the process which has enabled thousands of manufacturers to turn out *better* products with big savings in time—labor—cost. It will do as much for you.

In the "home made" turn-table and fixed torch set-up above, all operator does is position assemblies with alloy preplaced and step on pedal. With such simple equipment you can speed torch brazing 'way up and make it practically fool-proof.

With the 6-place jig and automatically timed induction heating coil fixture at right, 20,000 food mixer blade assemblies, 3 joints each, are EASY-FLO brazed per week. There's literally no limit to the production you can get with alloy preplacement and fast heating methods.

WE ARE READY TO HELP YOU

determine where and how you can use low-temperature EASY-FLO and SIL-FOS alloy brazing to your profit. With no obligation to you we will send a field engineer to go over your work with you.

For the facts in print, write today for Bulletins 12-A and 15.

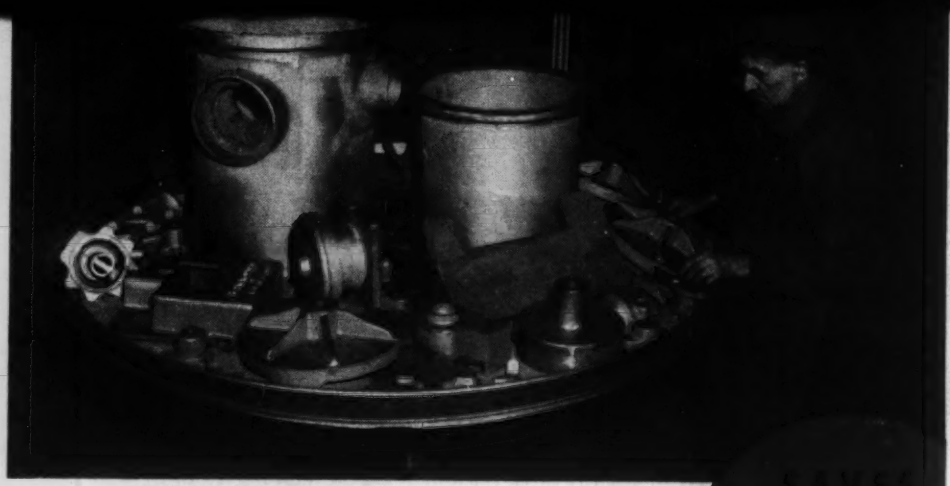
AT THE A.S.T.E. INDUSTRIAL EXPOSITION
PHILADELPHIA, APRIL 10-14

SEE torch brazing demonstrations and an actual production brazing job in action—also examples of work from many industries. Come in and talk over your metal joining problems with our experienced engineers —BOOTH 607.

HANDY & HARMAN

82 FULTON STREET NEW YORK 7, N. Y.

Bridgeport, Conn. • Chicago, Ill. • Los Angeles, Cal. • Providence, R. I. • Toronto, Canada
Agents in Principal Cities



wheelabrator®
airless blast cleaning

SAVES $5,440 YEARLY

COST COMPARISON CHART	FORMER METHOD	WHEELABRATOR METHOD
MACHINE	3 tumbling mills	66" Wheelabrator Swing Table
PRODUCTION	2 tons per day	4 tons per day
LABOR	2 men — 12 man hours per day	2 men — 6 man hours per day
CLEANING COST	Per ton — $8.095	Per ton — $2.655

SAVINGS per ton $5.44 per day $21.76 per year $5,440.00

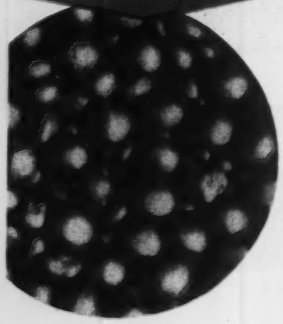
Elkhart Iron Works cuts cost 60%

The Elkhart Iron Works of Elkhart, Indiana, with a production of only four tons daily, has a wide variety of castings to clean because of the many building specialties they produce. Their previous cleaning method was unsatisfactory because of high breakage, and the relatively high cost and poor quality of cleaning.

The 66" Wheelabrator Swing Table eliminated costly breakage, cut cleaning costs 66%, did a thorough job of cleaning, and produced the high quality finish desired.

There is no sounder investment than a Wheelabrator because it customarily pays for itself out of savings within 6 to 18 months. *Why not find out more today?*

TRU-STEEL **shot cost less to use**



Accurate records were kept by a soil pipe foundry comparing TRU-STEEL and chilled iron shot over a period of 104.5 wheel hours. Only 3.349 lbs. of TRU-STEEL shot was needed to do the same work as 19.27 lbs. of Chilled Iron. Result: a saving of $80.64 or 65%.*

*Name on request

American

WHEELABRATOR & EQUIPMENT CORP.

509 S. Byrkit St., Mishawaka 5, Ind.

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT

ASTE EXPOSITION

Company	Booth No.

O K Tool Co., Div., Williams & Hussey Machine Co. 221
Shelton, Conn.
To Exhibit—Various types of tools, machinery parts

Tinius Olsen Testing Machine Co. 1146
Willow Grove, Pa.
To Exhibit—*Electrodyne dynamic balancing indicator demonstrated on crankshaft size machine; *10,000-pound model LC tensile testing machine, a low cost small capacity production type machine; stiffness testing machine

O'Neil Irwin Mfg. Co. 316
Lake City, Minn.
To Exhibit—*Di-Acro Hydra-Power bender, *Di-Acro Vari-O-Speed power shear, Di-Acro bender, Di-Acro brake, Di-Acro shear, Di-Acro notcher, Di-Acro punch, Di-Acro rod parter

Ortman Miller Machine Co. 110
Hammond, Ind.
To Exhibit—Air and hydraulic cylinders and valves

Ozalid Divison, General Aniline & Film Corp. 537
Johnson City, N. Y.
To Exhibit—*Streamliner all purpose copying machine, Printmaster, Super B copying machines, sensitized papers, cloths and films for positive printing, dry processing reproduction

Pangborn Corp. 749
Hagerstown, Md.
To Exhibit—*Large Hydro-Finish blast cabinet, equipped with accessory track and loading car, in operation. Hydro-Finish is a modified form of impact blasting using an abrasive suspended in a liquid which is delivered to blasting nozzle by circulating pump

Pedrick Tool & Machine Co. 21
Philadelphia, Pa.
To Exhibit—Model A-5 Bantam bender

Penton Publishing Co. 942
Cleveland, O.
Publishers of STEEL, THE FOUNDRY, MACHINE DESIGN and NEW EQUIPMENT DIGEST

Physicists Research Co. 233
Ann Arbor, Mich.
To Exhibit—Profilometer surface measuring equipment

Pines Engineering Co. 1168
Aurora, Ill.
To Exhibit—*Series 1400 semiautomatic tube bending machine in operation producing chrome plated furniture parts; bending movement is initiated by hand lever responding to 2-inch movement; hand wheel offers selection of preset angle-of-bend from a standard four-position turret; 300 bends per hour in 1-inch diameter 16-gage steel tubing are possible. *Series 700 tube and rod end finishing machine for chamfering tubing and pointing bars; up to 3-inch work is held stationary by automatic air-operated chuck; revolving spindle is fed to work by manually-operated hand lever (air spindle advance optional); spindle drive motor has variable speed control. Series 600 tube and rod end finishing machine of 2-inch capacity. Size ¾ automatic tube bending machine producing aluminum extruded sections for house trailer window frames

Pioneer Pump & Mfg. Co. 532
Detroit, Mich.
To Exhibit—Line of centrifugal coolant pumps conforming to Joint Industry Conference standards to permit use of any NEMA motor

Porter Machine Co. 142
Cincinnati, O.
To Exhibit—Three-piece piercing punch

Frederick Post Co. 326
Chicago, Ill.
To Exhibit—Line of blueprinting and white-printing reproduction supplies

Horace T. Potts Co. 1165
Philadelphia, Pa.
To Exhibit—Tool steels, stainless steels

Pratt & Whitney Division, Niles-Bement-Pond Co. 815
West Hartford, Conn.
To Exhibit—*Model F Air-O-Limit comparator; *Syncro-Timer preset remote control de-

Company — Booth No.

ice for governing automatic sorting and distributing, installed on miniature conveyor; combination Tri-Roll gage; *beta ray continuous gage; *reversible cylindrical and thread plug gages; line of steel and carbide cutting tools; conventional gages; line of Electrolimit external and internal comparators; basic measuring equipment; Super-micrometer; mill gages; Keller milling cutters; Hi-helix end mills with cupped ends; carbide-tipped and solid carbide taps; cutters and reamers; Model F Air-O-Limit comparator for gaging internal and external diameters, straightness, width and length, taper, out-of-roundness, etc.; *duplex indicator incorporating two independent gage indicators with individual pointers, permitting dual readings on one Air-O-Limit meter (also see Kellerflex Division, Booth 632)

Precise Products Co. **441**
Racine, Wis.

To Exhibit—Super 40 portable grinder-miller with speed from 20,000 to 45,000 rpm and ¼-hp standard 115 v ac-dc electric motor; applications: Internal, external, cylindrical and form grinding, milling with high speed steel or tungsten carbide midget mills, sawing, routing, slotting, small diameter drilling and finishing, microfinishing, polishing. Attachments for above tool: Varispeed lathe, slotter and commutator undercutter, universal wirestripper, Coolflex Flexshaft extension, collets, chuck extensions, wheel arbors, milling tables, angle mounts, speed controls, etc. Gorton No. 8A Duplicator, Bridgeport Master milling machine, South Bend precision toolroom lathe, South Bend precision drill press—all equipped with Super 40 and Super 50 grinder-millers mounted through standard machine tool mounts

Precision Detroit Co. **544**
Detroit, Mich.

To Exhibit—Automatic dial presses, index tables

Precision Grinding Wheel Co. . . **1046**
Philadelphia, Pa.

To Exhibit—Grinding wheels and machines

Procunier Safety Chuck Co. **611**
Chicago, Ill.

To Exhibit—*No. 4F Tap King heavy duty tapping head, with capacity of ⅜ to 1 inch in steel, 1⅛-inch in softer materials; style E series high speed tapping heads; universal foot-operated tapping machines; style H quick change chucks and collets; style C friction tap holders; style TG Tru-Grip tap holders

Production Machine Co. **1042**
Greenfield, Mass.

To Exhibit—Centerless polishing machine

Producto Machine Co. **1065**
Bridgeport, Conn.

To Exhibit—Die sets, vises, shearing press, hand tapper

Putman Tool Co. **1119**
Detroit, Mich.

To Exhibit—Cutting tools, mills, reamers, counterbores

Racine Tool & Machine Co. **222**
Racine, Wis.

To Exhibit—High speed metal cutting machines, pumps, valves

Rahn Granite Surface Plate Co. . . **720**
Dayton, O.

To Exhibit—*Angle plates, *parallels, *straight edges and surface plates of black granite (diabase), with tolerance to 0.00005-inch said to be maintained almost indefinitely; in case of nicking no burrs result; abrasives cannot become embedded in surface

Ready Tool Co. **304**
Bridgeport, Conn.

To Exhibit—Machine tool accessories

Republic Gage Co. **947**
Detroit, Mich.

To Exhibit—*Titanium solid ring thread gage of insert type with knurled aluminum collar

Rivett Lathe & Grinder Inc. **1020**
Brighton, Mass.

To Exhibit—*High pressure intensifier, capable of developing hydraulic pressures up to 200,000 psi; *complete assembled unit consisting of high pressure intensifier, low pressure cylinder, valving and power unit, to be

Use Reply Cards on Page 153 for
FURTHER INFORMATION

HOT OFF THE PRESS . . . NEWS OF IMPORTANCE TO BUSINESS EXECUTIVES

DAY AFTER DAY, new and profitable uses are found for CLARK fork-lift trucks and industrial towing tractors. Top flight operators, materials handling engineers and other plant officials, continue to develop applications for these machines that make them mobile "gold mines." Almost without exception, such new uses are as valuable to others as to their originators.

Many of these new ideas and applications are presented and illustrated in CLARK'S new MATERIAL HANDLING NEWS.

"Profitable reading" best describes this publication. If you already operate CLARK fork trucks, it may help you to employ them to even better advantage. If you are not yet a CLARK fork-truck user, you're certain to learn how they can be employed to your considerable profit.

FREE TO BUSINESS EXECUTIVES

For your copy of the new "how to handle it" issue of Material Handling News clip and mail this handy coupon . . . TODAY!

CLARK ELECTRIC AND GAS POWERED FORK TRUCKS AND INDUSTRIAL TOWING TRACTORS

INDUSTRIAL TRUCK DIVISION • CLARK EQUIPMENT COMPANY • BATTLE CREEK 26, MICH.

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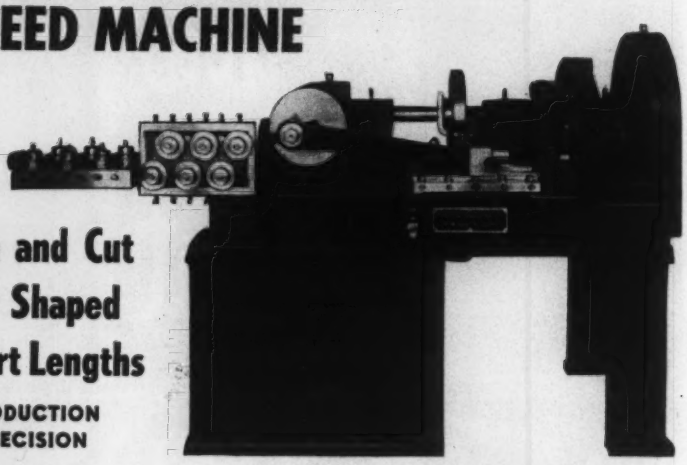
CITY_____ ZONE_____ STATE_____

AUTHORIZED CLARK INDUSTRIAL TRUCK PARTS AND SERVICE STATIONS IN STRATEGIC LOCATIONS

SHUSTER *Automatic* SLIDE FEED MACHINE



Straighten and Cut Round or Shaped Stock, Short Lengths

HIGH PRODUCTION
HIGH PRECISION

Production, 125 pieces per minute.

Recommended wherever accuracy and a perfectly square cut are a "must." In this machine, the stock receives a *shearing cut* from two round dies. This method of cutting produces an accurately square cut and holds the length of cut to very close tolerances.

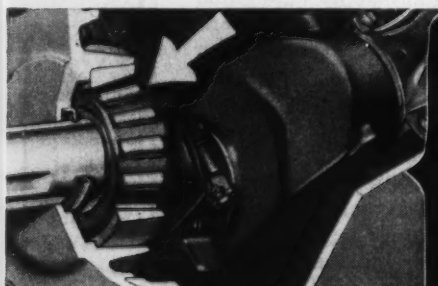
Capacity: ½" to 10" lengths; maximum diameter of rod, 9/16"; production, 125 pieces per minute. May be had without the 12-roll straightener if your stock is already straightened.

Detailed circulars on request. When writing please describe your set-up.

Mfd. by METTLER MACHINE TOOL, INC.

132R Lawrence St. **New Haven, Conn.**

Representatives in all principal cities and foreign countries.



Why
WISCONSIN
HEAVY-DUTY *Air-Cooled*
ENGINES
Run on Timken Tapered Roller Bearings

Single cyl. 3 to 9 hp.

2-cylinder 7 to13 hp.

V-type 4-cyl. 15-to 30 hp.

Ever since the first Wisconsin Air-Cooled Engine was built over 20 years ago, the crankshaft of every one of these fine engines has been supported by Tapered Roller Bearings at BOTH ENDS. Here's why:

1. Tapered Roller Bearings take up all *End Thrusts* and *Radial Loads* (impossible with other types of bearings). You can mount your drive directly on the extended crankshaft of any Wisconsin Engine without the need for an extra thrust bearing or outboard bearing.

2. Tapered Roller Bearings *resist wear* to a greater extent than other types of bearings not only because of the file-hard surfaces of Timken Tapered Bearings but also because these bearings are inherently SELF-CLEANING. Oil enters at the smaller end of tapered roller bearings and centrifugal force carries it out through the large end, thus preventing accumulations of dirt and sludge that is often present in the oil. (Tapered bearings cannot develop shaft-cutting abrasive surfaces.

3. Tapered Roller Bearings permit flexing of the crankshaft to a much greater degree than the longer, rigid plain bearings which cannot stand up under flexing conditions, resulting in wearing "bell-mouthed" or failing completely. We have yet to hear of a single case of Wisconsin Engine bearing failure.

The use of dependable Tapered Roller Bearings in ALL Wisconsin Engines from the smallest to the largest . . . 3 to 30 hp., single cylinder, 2-cylinder and 4-cylinder . . . is typical of the engineering diligence devoted to providing the user with "Most H.P. Hours of on-the-job service".

WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 14, WISCONSIN

ASTE EXPOSITION

Company **Booth No.**

demonstrated measuring fracture point on steel tubing; air cylinders and valves; hydraulic cylinders, valves and power units

Rockwell Mfg. Co. **843**
Milwaukee, Wis.
To Exhibit—*Air-operated, fully automatic, repeat, timer controlled 5KVA rocker arm type spot welder, air-hydraulic drill units; *Model 2, ½-hp 1½ inch spindle travel; *model 3, ¾ to 1½ hp, 4-inch spindle travel; *model 5, 2 to 5 hp; belt and disk abrasive finishing machines; bench centers; coolant pump and tank; cutoff machine; standard and super high speed, single and multiple spindle drill presses; surface, chip-breaker, tool and cutter and carbide grinders; layout plate; grinding, polishing and deburring machine of backstand, belt type; universal vise; universal work head

Ross Operating Valve Co. **139**
Detroit, Mich.
To Exhibit—*Water-saver, liquid and in-line master valves; *time delay valve; *¼ and ⅜-inch hand and foot valves; *direct current and explosionproof solenoids for use on Ross pilot controlled valves; hand, foot, solenoid, remote controlled and mechanical operating valves; straight-way, speed control and special purpose valves

H. B. Rouse & Co. **204**
Chicago, Ill.
To Exhibit—*No. 9 collet holding unit for hand miller which takes such operations as spline cutting, cross slotting, small screw slotting, slitting and squaring at different angles off heavy machines; hand miller for light cuts in brass, aluminum and similar materials, and small, rounding and burring operations on steel and cast iron, spindle adapted for small circular milling cutters or small end mills; various fixture set-ups for hand millers and other machines which facilitate tooling of completed fixtures; coolant pan for hand miller; two hand millers set up on typical work

Rudel Machinery Co. **502**
New York, N. Y.
To Exhibit—Swiss jig borer

Russell, Holbrook & Henderson Inc. **608**
New York, N. Y.
To Exhibit—*Petermann P-16 automatic screw machine of 16 mm capacity, *Petermann P-25 automatic screw machine of 25 mm capacity, Petermann grinding and lapping machine, Agathon universal carbide grinder, Petermann P-4 automatic screw machine of 5/32-inch capacity, Petermann P-7 automatic screw machine of ¼-inch capacity

Jos. T. Ryerson & Son Inc. **334**
Chicago, Ill.
To Exhibit—Machining demonstration on Rycut free-machining alloy steel used in manufacture of strong, tough parts involving considerable machining in production

Sales Service Machine Tool Co. . . **902**
St. Paul, Minn.
To Exhibit—*85-ton Press-Rite power press, Press-Rite power presses of 5 to 30 ton capacities, Shape-Rite shaper with 8-inch stroke, Keller power hacksaws

Schauer Mfg. Corp. **949**
Cincinnati, O.
To Exhibit—*Type NA1ECA speed lathe with air-operated collet mechanism, mounted on new type lathe bed, equipped with air-operated cut-off device and tailstock; type NAD, NA1C, VA3BC speed lathes

Geo. Scherr Co. Inc. **209**
New York, N. Y.
To Exhibit—*Koepfer gear hobbing machine, Leitz surface finish comparator, alignment and binocular microscopes, comparator gages, contour measuring projectors, gage blocks, gear testing machines, height gages, jig borer, measuring and toolmakers' microscopes, measuring tools, vernier calipers

A. Schraders Son **752**
Brooklyn, N. Y.
To Exhibit—Air-operated press control equipment

Schramm Inc. **1132**
West Chester, Pa.
To Exhibit—Several models of large industrial compressors, including a No. 210 stationary

Company — Booth No.

compressor with all necessary accessories, V-belt drive; compressor will furnish air to all exhibitors using compressed air

Scully-Jones & Co. **643**
Chicago, Ill.

To Exhibit—*Style JA floating tool holders, *tension and compression tap holders for multiple spindle machines, *adjustable spacing collars for milling machine arbors, *live centers, automatic recessing and grooving tools, quick-lock adjustable adapters and nuts for multiple spindles, style A tap chucks, style B drill chucks

Seibert & Sons Inc. **1052**
East Peoria, Ill.

To Exhibit—Multiple spindle drilling equipment

Service Machine Co. **619**
Chicago, Ill.

To Exhibit—Open back inclinable, adjustable bed horning, and deep throat presses

Severance Tool Industries Inc. ... **953**
Saginaw, Mich.

To Exhibit—Mills, deburring cutters

Sheffer Collett Co. **1050**
Traverse City, Mich.

To Exhibit—Cam generating machines, screw machine tools

Sheffield Corp. **836**
Dayton, O.

To Exhibit—*Bearing radial play gage, *bearing race matching gage, *automatic piston pin checking machine, *dial type Precisionaires, *Crushtrue roll devices, *Crushtrue rolls, *new Precisionaire applications, Murchey die heads and collapsible taps, solid taps, standard precision gages, visual gages, Electricheks, Multicheks, column type Precisionaires, dial type Precisionaires, Crushtrue grinding equipment

Sheldon Machine Co. **430**
Chicago, Ill.

To Exhibit—*9-inch swing lathe, 10 and 11-inch lathe, milling machine and shaper

Shell Oil Co. Inc. **922**
New York, N. Y.

To Exhibit—Cutting fluids

Siewek Tool Co. **2**
Detroit, Mich.

To Exhibit—*Cam type fixture lock, drill jigs, fixture locks, fixture clamps, fixture details

Simmonds Abrasive Co. **516**

Simmonds Saw & Steel Co. **516**
Fitchburg, Mass.

To Exhibit—Circular saw blades, bandsaw and hacksaw blades

Simpson Electric Co. **714**
Chicago, Ill.

To Exhibit—*Radio, television and industrial test equipment and panel meters

Size Control Co. Division, American Gage & Machine Co. **714**
Chicago, Ill.

To Exhibit—*Reversible carbide thread gages, *electric small hole gage, line of reversible plug gages, rings, specials, thread and gear measuring wires, cabinet sets, centerless lapping machine

Socony Vacuum Oil Co. Inc. **1035**
New York, N. Y.

To Exhibit—Cutting fluids

South Bend Lathe Works **923**
South Bend, Ind.

To Exhibit—Series 1000 precision turret lathe in operation making cigarette lighter cases from aluminum bar stock which is fed through a handlever operated collet by pneumatic bar feed; hexagon turret carries five tools in addition to stock advance stock—centering drill, first drill, size drill, reamer and inside chamfer tool. Toolroom and quick change gear lathes ranging from 9 to 16-inch swing, 14-inch drill presses and 7-inch bench shaper

Sperry Products, Inc. **13**
Danbury, Conn.

To Exhibit—Reflectoscope instrument for locating defects in metals by transmission of

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FURTHER INFORMATION

Operating a major airline like Capital over 5,409 route miles in the industrial heart of the United States, requires aircraft servicing bases of considerable size. One such base in Chicago daily readies planes for passenger, mail and cargo service. Maintenance operations of this type present serious fire hazard problems, for a flash fire in the hangar area could result in building and equipment losses of staggering proportion. That's why Capital Airlines safeguards her capital investment with "Automatic" Sprinkler fire protection.

Scores of sensitive Rate-of-temperature-Rise heat detectors stand ready to discover fire at the first indication of flame. Hundreds of scientifically spaced "Automatic" Sprinklers, operating off a battery of Suprotex-Deluge systems, are prepared to shower water throughout the fire area, thereby protecting the building and contents. And most important, the entire operation would be accomplished within seconds from the time the fire originated. Little wonder that Capital looks upon "Automatic" Sprinklers as an important improvement in their unceasing program of positive fire defense.

Whether yours is an airline operation or any other type of commercial, industrial or institutional business, you'll get dependable fire protection with "Automatic" Sprinklers. Write or call today for complete information on how you can save lives... save property... and save money with "Automatic" Sprinklers.

"AUTOMATIC" SPRINKLER CORPORATION OF AMERICA
YOUNGSTOWN 1, OHIO

"Automatic" Sprinkler
FIRST IN FIRE PROTECTION
DEVELOPMENT . ENGINEERING MANUFACTURE . INSTALLATION
OFFICES IN PRINCIPAL CITIES OF NORTH AND SOUTH AMERICA

ASTE EXPOSITION

Standard Die Set Manufacturers Inc. — 926
Cranston, R. I.
To Exhibit—Die sets, automatic screw machines

Standard Electrical Tool Co. — 965
Cincinnati, O.
To Exhibit—*Type TD twin-wheel tool grinder, available in five different types ranging from 1 to 3 hp in 10 and 14-inch diameter wheels, for grinding carbide, stellite and high speed steel tools; vertical spindle grinder, precision external and internal grinders, tool post or center grinders, angle-plate grinders, bench backstand idlers

Standard Gage Co. Inc. — 932
Poughkeepsie, N. Y.
To Exhibit—*Snap gage dializer, DuBo plug gage, indicating gages, dial indicators, comparators, adjustable limit gages, fixed limit gages

Standard Pressed Steel Co. — 128
Jenkintown, Pa.
To Exhibit—*Hallowell Carry Tool tool toter, *line of Hallowell steel posture stools, *line of Hallowell steel foreman's desks, *Hallowell 700 steel platform trucks, Hallowell steel work benches, Unbrako socket screw products, Flexloc self-locking nuts, Hallowell steel shaft collars

Standard Shop Equipment Co. — 1157
Philadelphia, Pa.
To Exhibit—Shop devices and equipment

Staples Tool Co. — 745
Cincinnati, O.
To Exhibit—Tungsten carbide-tipped tools

Star Gauge Co. — 540
Springfield, Mass.
To Exhibit—Small grinding fixtures, surface grinder

L. S. Starrett Co. — 322
Athol, Mass.
To Exhibit—*No. 354 vernier height gage featuring a slotted base which permits taking direct readings or scribing lines at any point from the base surface of the tool up to the limit of its capacity in layout work, jig and fixture making, etc.; *No. 1015 portable dial hand gage for accurate gaging of thickness of materials and parts, offered in two thickness capacities and ranges, throat capacity is 2½ inches; *Universal dial bench gage with sliding table and fine adjustment; *dial comparator with fine vertical indicator adjustment; *several dial depth gages; *Last Word test indicator with universal friction holder, universal shank and other attachments; *Universal precision gage with fine adjustment; Satin Chrome micrometer calipers with tapered frame; tubular and solid rod inside micrometers with Satin Chrome finish; line of micrometer depth gages with 2½, 3, 4 and 5-inch bases

STEEL — 942

Steel Products Engineering Co. — 431
Springfield, O.
To Exhibit—Brehm trimming dies used for trimming drawn shells, stock thickness can vary from 0.005-inch brass to 0.218-inch steel; used on parts with straight edges, notches, projections, etc., dies complete all operations in one press stroke

Edwin B. Stimpson Co. Inc. — 647
Brooklyn, N. Y.
To Exhibit—Metal goods, fastening machines

Stokerunit Corp. — 1066
Milwaukee, Wis.
To Exhibit—(Simplex Machine Tool Division): *All machines on exhibit have sealed and self-lubricated precision boring heads, No. 1 mechanical feed precision boring machine, No. 2B mechanical feed precision boring machine, No. 2D1 mechanical feed double-end precision boring machine, No. 2U 2-way hydraulic feed precision boring machine

Stone Machinery Co. Inc. — 106
Manlius, N. Y.
To Exhibit—*"Swing-cut" metal cutoff machine type M-16, equipped for wet cutting with abrasive wheels; same type of machine demonstrating dry abrasive cutting

D. A. Stuart Oil Co. — 116
Chicago, Ill.
To Exhibit—Cutting fluids, coolants

Sun Oil Co. — 717
Philadelphia, Pa.
To Exhibit—Cutting fluids, coolants

Sundstrand Machine Tool Co. — 907
Rockford, Ill.
To Exhibit — (Hydraulic Division): *New pumps, valves, fluid motors and tank units which conform to J.I.C. standards; (Pneumatic Division): *bench centers and *balancing tools for checking and inspection, operating exhibit of single and double pad portable sanders for sanding, rubbing or polishing on metal, wood and plastics; (Sundstrand Magnetic Products Co. Division): *Work-holding fixture with Viking chuck mounted on adjustable fixture for general purpose milling work, Power Grip magnetic chucks with display of magnetic work-holding setups for keyway milling, die block milling, form grinding and diversified tool room work

Sunnen Products Co. — 531
St. Louis, Mo.
To Exhibit—*Honall portable tool for sizing and finishing holes requiring geometric accuracy and fine surface finish; for use on all metals; range of hole diameters is $\frac{3}{16}$ to 1 inch; offered as complete unit or in interchangeable combinations of components; driven by electric or air drill, lathe or drill press. *Hone for sizing and finishing external diameters for use with all metals; covers diameter range of ⅛ to 2¾ inches; dimensional accuracy to within 0.0001-inch; parts to be sized may be driven by Sunnen wet honing machines, lathes, drill presses or other power machines.

Super Tool Co. — 315
Detroit, Mich.
To Exhibit—Solid carbide drills in sizes from No. 53 to ¼-inch; carbide-tipped drills from No. 32 to 1 inch in regular spiral, from No. 15 to ½-inch in fast spiral, from No. 32 to ½-inch in slow spiral; ejector type tools; shell end mills; plain, side and face milling cutters; biaxial slotting cutters; saws; step milling cutters, end mills, reamers; adjustable blades for reaming and boring; counterbores; core drills, centers; twist, glass, masonry and straight flute drills, Super Hard drills for hardened steel; carbide single point tools for turning, facing, threading and boring

Sutton Publishing Co. Inc. — 558
New York, N. Y.

Syntron Co. — 24
Homer City, Pa.
To Exhibit—*Vibratory small parts feeders

Taft Peirce Mfg. Co. — 325
Woonsocket, R. I.
To Exhibit—Precision tools, magnetic chucks

Taylor Dynamometer & Machine Co. — 653
Milwaukee, Wis.
To Exhibit—High-lift drilling machine, static balancer

Texas Co. — 512
New York, N. Y.
To Exhibit—Cutting oils

Tide Water Associated Oil Co. Inc. — 757
New York, N. Y.
To Exhibit—*Cutting oils of the transparent sulpho-chlorinated type; Tycol branded oils and greases for industry

Todd Co. Inc. — 310
Rochester, N. Y.
To Exhibit—Lathe accessories

Tomkins Johnson Co. — 971
Jackson, Mich.
To Exhibit—Rivet-setting machines

Trabon Engineering Corp. — 1116
Cleveland, O.
To Exhibit—*Model KA-12-M automatic motor-driven oil or grease pump; model MP-12 motor-driven and model 3400 mechanically driven automatic oil or grease pumps operating improved design type M and MX distributors; type K manual pumps with reversible single line feeders

Tubular Micrometer Co. — 722
St. James, Minn.
To Exhibit—Precision measuring instruments

Company — Booth No.

Twentieth Century Co. 536
Chicago, Ill.
To Exhibit—Counterbores, reamers

Union Mfg. Co. 650
New Britain, Conn.
To Exhibit—*Die sets, *chucking equipment

U. S. Department of Commerce .. 39
Washington, D. C.
To Exhibit—Data on type and quantity of machinery and allied products currently being sought by various foreign countries; latest census data available for reference; facilities of Office of International Trade. Office of Domestic Commerce and ECA available

Universal Vise & Tool Co. 1152
Parma, Mich.
To Exhibit—*Drill press vise which fastens directly to column of drill press, insuring safety in drilling at all times; three-way vise for angle machining; adjustable angle plates; safety work-holder

Univertical Machine Co. 542
Royal Oak, Mich.
To Exhibit—*Soft gilding metal safety hammers

Urbauer Engineering Co. 14
Freeport, Ill.
To Exhibit—*Gearmaster system of measuring gears, consisting of precision gear micrometer and direct reading charts and instructions for making gear checks for all nine measurements and gear characteristics in one setup

V & O Press Co. 764
Hudson, N. Y.
To Exhibit—Press feeding attachment

Vanadium-Alloys Co. 666
Latrobe, Pa.
To Exhibit—*Vasco Supreme cutting and die steel, *typical tools made of Vasco Supreme displayed with performance records demonstrating cost cutting economies

Van Keuren Co. 410
Watertown, Mass.
To Exhibit—*Light micrometer bench measuring machine, that makes direct measurements in units of 0.00001-inch, for over wire measurement of screw threads, taps, gears and splines, standardization of plug gages, etc.; fused quartz optical flats, monochromatic lights, gage blocks, microgages, thread measuring wires, gear measuring wires, wire type plug gages, taper insert plug gages, Carboloy plug gages and measuring wires, steel optical flats

Vapor Blast Mfg. Co. 555
Milwaukee, Wis.
To Exhibit—Liquid honing machine

Versa Mil Co. 330
New York, N. Y.
To Exhibit—*Versa-Mil Junior power unit, milling and drilling head, external and internal grinders; *dividing head for both Junior and regular Versa-Mil models; Versa-Mil regular power unit, milling and drilling head 90 degree universal head, external and internal grinders, feed table

Vibro Modulator Mounts 748
To Exhibit—Vibration-absorbing mountings

Vickers Inc. 239
Detroit, Mich.
To Exhibit—Hydraulic pumps

Viking Tool Co. 108
Shelton, Conn.
To Exhibit—Solid carbide single-point tools

Vlier Mfg. Co. 427
Los Angeles, Calif.
To Exhibit — Torque thumb screws, spring plungers, spring stops, fixture keys

Waldes Kohinoor Inc. 1135
Long Island, N. Y.
To Exhibit—Retaining rings

Wales-Strippit Corp. 908
North Tonawanda, N. Y.
To Exhibit—*Wales sheet metal fabricator, *Wales hole punching and notching equipment

Use Reply Cards on Page 153 for
FURTHER INFORMATION

"Catsup ON YOUR ICE CREAM?"

Just because you used catsup on your steak, the waiter shouldn't assume you use it on the rest of your dinner too!

And just because one bearing is best lubricated by one particular grade of oil, you shouldn't assume that the same oil is best for *all* bearings on that machine. In many cases it isn't.

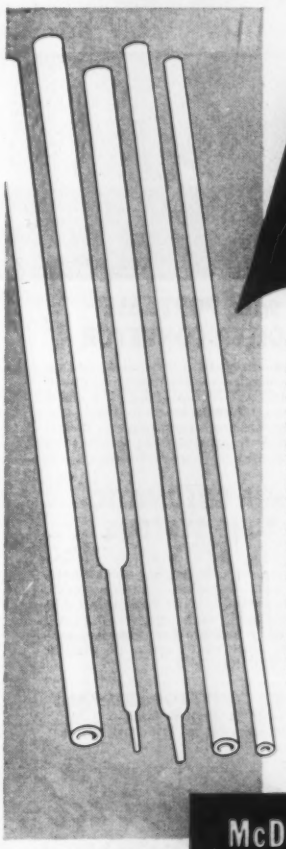
OIL CUPS permit you to lubricate each bearing with the oil best suited to that bearing—thus prolonging bearing life, reducing maintenance costs, cutting down-time, boosting production. And oil cups fortunately *cost very little.*

Gits oil cups have been the standard for industry for more than 40 years. Gits Bros. has the largest selection of oil cups available anywhere. Call on Gits Bros. for a prompt, efficient solution to your lubrication problems.

Write for free Price Guide Catalog

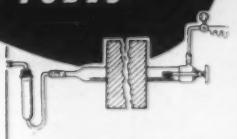
GITS BROS. MFG. CO.

1844 S. Kilbourn Ave. • Chicago 23, Ill.



SUPERIOR PERFORMANCE

with **McDANEL**
HIGH TEMPERATURE
COMBUSTION TUBES



Especially made for carbon and sulphur determination work, McDanel Porcelain Combustion Tubes and Zirco Tubes take the sharp temperature changes of an electric furnace like a duck takes to water.

Superior performance—and lower replacement costs—are assured! Here is what leading metallurgists in the steel industry say about McDanel Tubes: "Highly satisfactory in every respect"—"Take temperature rises and drops exceptionally well"—"Give better service as well as longer life."

OTHER McDANEL PRODUCTS

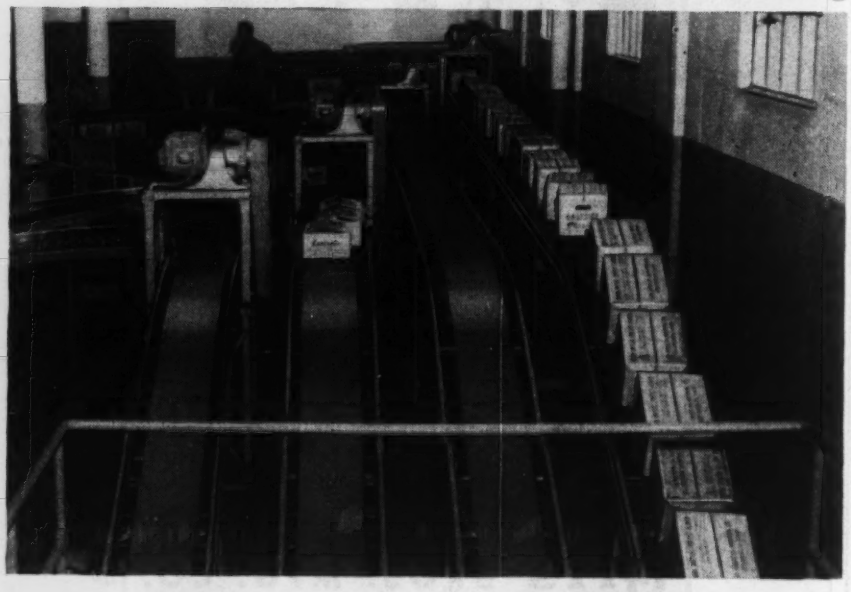
- Non-spalling, non-blistering, gas tight Combustion Tubes.
- High Temperature Zirco Tubes.
- Self Cooling Combustion Tubes.
- Refractory Porcelain Specialties in stock or designed to meet your needs.

Specify McDanel High Temperature Porcelain Combustion Tubes and Zirco Tubes from your supplier.

McDANEL REFRACTORY PORCELAIN CO.
BEAVER FALLS, PENNA.

Look at All

FOUR WAYS To get Fast Lower-Cost Handling



1 WITH ROLLER OR BELT CONVEYORS

— Order and cleanliness — freedom from congestion — smooth flowing coordinated movement of commodities — these are the plus advantages of roller or belt conveyors, gravity or power, in addition to their time, money, and manpower economies.

2 with the EXTENDOVEYOR

— compact, mobile, easily maneuverable power-belt conveyor unit—handles packages up to 150 lbs.—reaches into cars, trucks, trailers. Available in 4 sizes — 2 models.

3 with PORTABLE ROLLER CONVEYOR

— light, easy to carry and set up where needed. Standard Litewate Sectional Roller Conveyor is a great time and labor saver in loading, unloading, storing commodities. Available in 5 ft. and 10 ft. sections — straight and 90° or 45° curves.

4 with PNEUMATIC TUBE SYSTEMS

— provide swift, sure, safe transportation of messages, documents, blueprints, samples, small parts, money; cylindrical or oval tubes 1½ inch upward with dispatching and receiving terminals for complete systems to meet your needs. Write for special bulletin SPT.

Write for Standard's general Catalog No. ST40. Tell us what you want to handle or name equipment on which you want more information.

STANDARD CONVEYOR COMPANY
North St. Paul 9, Minn.
Sales and Service in Principal Cities

ASTE EXPOSITION

Company	Booth No.
Walker-Turner Division, Kearney & Trecker Corp. Plainfield, N. J.	105

To Exhibit—*Electrically driven power feed for metal cutting band saws, *16-inch metal cutting band saw with feeding device, air feed adapted to drill presses and radial cut-off saws

Walsh Press & Die Co. Chicago, Ill.	716

Watson-Flagg Machine Co. Inc. Paterson, N. J.	1142

To Exhibit—Precision thread roller

Weatherhead Co. Cleveland, O.	1041

To Exhibit—Flaring installation and hose assembly technique

Webber Gage Co. Cleveland, O.	708

To Exhibit—*Carblox (carbide) precision gage block sets, *heavy duty gage blocks and fixture sets, *taper-Chek, standard precision gage block sets, angle gage block sets, special size gage blocks in either heavy duty gage blocks, angle gage blocks or Carblox

Wesson Co. Detroit, Mich.	1013

To Exhibit—*Band type Multicut solid carbide insert tool holder, *fine pitch milling cutter with solid or tipped blades, *Grade M Wessonmetal for heavy cuts and slow speeds, plate type Multicut holder, Rigidcut face mills, Varicut side mils, reamers, counterbores, flat tools, tips

West Point Mfg. Co. Farmington, Mich.	1141

To Exhibit—*Swing C-washers, *socket head shoulder screws, *round locating pins, *flatted locating pins, *double-end clamp straps, *high tensile strength bolster bolts, *hand knobs, clamp assemblies, cams, eye bolts, spherical washers, quarter-turn screws, plain washers, C-washers, acorn nuts, flange nuts, fixture keys, rest buttons, knob shoe assemblies

Western Tool & Mfg. Co. Springfield, O.	1118

To Exhibit — *Champion precision expanding mandrels, Champion expanding mandrels, Champion C-clamps, Champion grinding wheel dressers and cutters, Champion steel storage racks

S. B. Whistler & Sons Inc. Buffalo, N. Y.	832

To Exhibit—*Magnetic perforating dies in actual operation on two presses; adjustable perforating dies; 90 degree perforating units; heavy duty adjustable perforating dies

Wickman Corp. Detroit, Mich.	109

To Exhibit—Diamond wheels, bench grinders

Wiedemann Machine Co. Philadelphia, Pa.	731

To Exhibit—Material handling equipment

Wilson Mechanical Instrument Co. New York, N. Y.	226

To Exhibit—Hardness testers

Wilton Tool Mfg. Co. Chicago, Ill.	550

To Exhibit—Power arm work positioners

N. A. Woodworth Co. Detroit, Mich.	435

To Exhibit—Precision boring machine

Wynn's Friction Proofing Oil Philadelphia, Pa.	19

To Exhibit—Antifriction oils

Zagar Tool Inc. Cleveland, O.	1124

To Exhibit—*Jig driller, gearless multiple drill heads, collet holding and indexing fixtures, broaches and broaching tools

Use Reply Cards on Page 153 for **FURTHER INFORMATION**

Market Summary

INGOT conversion tonnage again holds the spotlight in the steel market. Frantic consumers, especially of the light, flat-rolled products, are contracting increasingly for premium-priced steel. Practically all automobile companies, including strike-bound Chrysler Corp., are buying conversion metal. Smaller manufacturers, such as miscellaneous stampers, over the past several weeks have been adding to the clamor to get on converters' books. This all adds up to what trade authorities describe as the most hectic conversion situation in the past 18 months.

REACTIVATED— Indicative of the renewed activity, an eastern producer of conversion ingot that has been closed down for months is resuming production. In the Chicago district, ingot is selling above $70 per ton with demand bubbling under pressure from sheet buyers. At Detroit and Youngstown, converters' scramble to cover their enlarged scrap requirements is injecting new life into the scrap trade. How long the run will last in the conversion market is problematical. But all signs point to strong demand through second quarter at least, with steel requirements in general expanding seasonally.

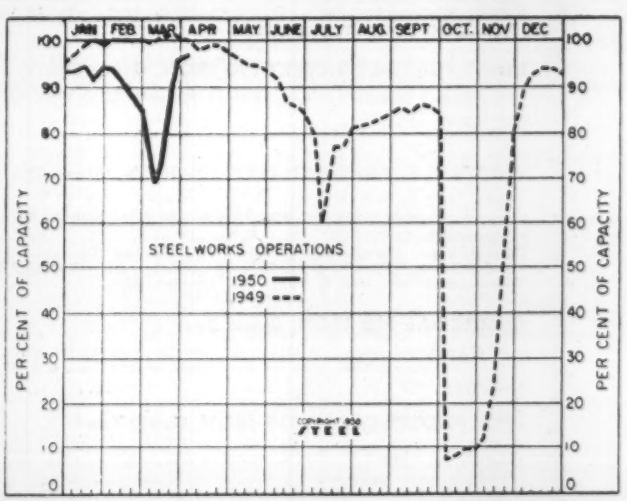
DEMAND— Virtually all major steel product classifications are in buoyant demand. Specialties are getting more attention. While the light, flat-rolled items are under greatest pressure, noticeable pickup in bar needs is reported. Plates are being sought more actively from mills that, until lately, had been scratching for tonnage. Structural steel needs are rising as the building season gets under way. Auto requirements continue pressing with no letdown sighted barring labor trouble now brewing. Railroad needs are heavier. Small fabricating shops are getting more tank and similar work. Appliance manufacturers are having a good season.

SUPPLY— Stringency in sheets and strip is the most critical in months. Demand exceeds production at least through July. Producers, booked through second quarter, have not opened books for third quarter. Substantial tonnage carryover from first quarter will push some second quarter deliveries well into summer. It now looks as though third quarter will be a 2-month production period so far as new bookings are concerned. Carbon bars are tighter, chiefly because producers' semifinished inventories are insufficient to support sustained rolling schedules. Plates are available for fairly prompt shipment but mill backlogs are growing. The same is true of structurals. Pig iron supply is adequate but foundry melt is rising.

PRODUCTION— Steelmaking operations have fully recovered from the fuel shortage. They now are highest since May, last year. Estimated national ingot rate rose 1 point last week to 97 per cent of capacity. District rates rose 8 points to 95 in the Far West, 2 points to 89 in eastern Pennsylvania, 2 points to 91 in St. Louis, 1.5 points to 100 in Chicago, 1.5 points to 102.5 in Wheeling, 1 point to 107 in Detroit.

PRICES— No changes of note are reported in steel prices. None is expected in the immediate future. Raw material prices are stronger, reflected in higher quotations on foundry coke at a few points. High-columbium content ore prices appear all over the map, it being impossible to determine the exact level of the market at present. Competition from foreign steel is increasing. Japanese nails are offered at almost $1 per keg under eastern mill quotations.

COMPOSITES— Stronger tone in scrap is reflected in a fractional increase in STEEL's price composite on steelmaking grades to $28.75. This is the fourth consecutive weekly increase but the index remains under the average of $30.33 a year ago. Weighted index on finished steel is unchanged at 156.13, as is the arithmetical finished steel price composite at $93.18. Composites on pig iron are steady with No. 2 foundry, $46.47, basic, $45.97, and malleable, $47.27.



DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended Apr. 1	Change	Same Week 1949	Same Week 1948
Pittsburgh	96.5	— 1*	98.5	92
Chicago	100	+ 1.5	99.5	94
Eastern Pa.	89	+ 2	94.5	76
Youngstown	100	0	101	83
Wheeling	102.5	+ 1.5	96.5	93.5
Cleveland	97	— 2.5*	103	91.5
Buffalo	104	0	104	70
Birmingham	100	0	100	74
New England	81	— 1	88	77
Cincinnati	97	— 6	103	96
St. Louis	91	+ 2	82.5	82.5
Detroit	107	+ 1*	104	104
Western	95	+ 8	99.5	..
Estimated national rate	97	+ 1	100	88

Based on weekly steelmaking capacity of 1,906,267 net tons for 1950; 1,843,516 net tons for 1949; 1,802,476 net tons for 1948.
*Change from revised rate.

Composite Market Averages

	Mar. 30 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)	156.13	156.13	156.13	154.01	100.65
Index in cents per lb.	4.230	4.230	4.230	4.172	2.727
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$93.18	$93.18	$93.18	$96.68	$57.55
No. 2 Fdry Pig Iron, GT	46.47	46.47	46.47	46.63	24.67
Basic Pig Iron, GT	45.97	45.97	45.97	46.22	24.00
Malleable Pig Iron, GT	47.27	47.27	47.27	47.34	25.29
Steelmaking Scrap, GT	28.75	28.66	27.67	30.33	19.17

Weighted finished steel index based on average shipments and prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No.1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Mar. 30 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.45	3.45	3.45	3.35	2.15
Bars, H.R., Chicago	3.45	3.45	3.45	3.35	2.15
Bars, C.F., Pittsburgh	4.10–15	4.10–15	4.10–15	3.95	2.65
Shapes, Std., Pittsburgh	3.40	3.40	3.40	3.25	2.10
Shapes, Std., Chicago	3.40	3.40	3.40	3.25	2.10
Plates, Pittsburgh	3.50	3.50	3.50	3.50	2.20
Plates, Chicago	3.50	3.50	3.50	3.40	2.20
Plates, Coatesville, Pa.	3.60	3.60	3.60	3.75	2.20
Plates, Sparrows Point, Md.	3.50	3.50	3.50	3.45	2.20
Plates, Claymont, Del.	3.60	3.60	3.60	3.95	2.20
Sheets, H.R., Pittsburgh	3.35	3.35	3.35	3.275	2.20
Sheets, H.R., Chicago	3.35	3.35	3.35	3.25	2.20
Sheets, C.R., Pittsburgh	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Chicago	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Detroit	4.30	4.30	4.30	4.20	3.15
Sheets, Galv., Pittsburgh	4.40	4.40	4.40	4.40	3.65
Strip, H.R., Pittsburgh	3.25	3.25	3.25	3.475	2.10
Strip, H.R., Chicago	3.25	3.25	3.25	3.275	2.10
Strip, C.R., Pittsburgh	4.15	4.15	4.15	4.375	2.80
Strip, C.R., Chicago	4.30	4.30	4.30	4.125	2.90
Strip, C.R., Detroit	4.35–40	4.35–40	4.35–40	4.35	2.90
Wire, Basic, Pittsburgh	4.50	4.50	4.50	4.15	2.60
Nails, Wire, Pittsburgh	5.30	5.30	5.30	5.20	2.80
Tin plate, box, Pittsburgh	$7.50	$7.50	$7.50	$7.75	$5.00

SEMIFINISHED

Billets, forging, Pitts. (NT)	$63.00	$63.00	$63.00	$61.00	$40.00
Sheet bar, mill (NT)	57.00–58.00	57.00–58.00	57.00–58.00	67.00	34.00
Wire rods, 7/32-⅜", Pitts.	3.85	3.85	3.85	3.775	2.00

PIG IRON, Gross Ton

Bessemer, Pitts.	$47.00	$47.00	$47.00	$48.08	$26.19
Basic, Valley	46.00	46.00	46.00	46.00	24.50
Basic, del. Phila.	49.44	49.44	49.44	50.30	26.34
No. 2 Fdry, Pitts.	46.50	46.50	46.50	47.58	25.69
No. 2 Fdry, Chicago	46.50	46.50	46.50	46.25	25.00
No. 2 Fdry, Valley	46.50	46.50	46.50	46.50	25.00
No. 2 Fdry, del. Phila.	49.94	49.94	49.94	50.80	26.34
No. 2 Fdry, Birm.	42.38	42.38	42.38	43.38	21.38
No. 2 Fdry. (Birm.) Del. Cin.	49.08	49.08	49.08	49.43	25.30
Malleable, Valley	46.50	46.50	46.50	46.50	25.00
Malleable, Chicago	46.50	46.50	46.50	46.50	25.00
Charcoal, Lyles, Tenn.	60.00	60.00	60.00	66.00	33.00
Ferromanganese, Etna, Pa.	175.00	175.00	175.00	163.00	140.33*

* Delivered, Pittsburgh.

SCRAP, Gross Ton

No. 1 Heavy Melt. Pitts.	$32.00	$32.00	$31.00	$32.50	$20.00
No. 1 Heavy Melt. E. Pa.	25.25	25.00	23.50	23.50	18.75
No. 1 Heavy Melt. Chicago	29.00	29.00	27.50	31.00	18.75
No. 1 Heavy Melt. Valley	32.75	31.75	31.25	29.25	20.00
No. 1 Heavy Melt. Cleve.	29.25	28.25	28.25	28.25	19.50
No. 1 Heavy Melt. Buffalo	28.25	28.25	28.25	30.50	19.25
Rails, Rerolling, Chicago	45.50	45.50	40.50	39.50	22.25
No. 1 Cast, Chicago	42.50	41.00	41.00	34.50	20.00

COKE, Net Ton

Beehive, Furn., Connlsvl.	$14.25	$14.25	$13.25	$14.50	$7.00
Beehive, Fdry., Connlsvl.	16.00	16.00	15.50	17.00	7.75
Oven Fdry., Chicago	21.00	21.00	21.00	20.40	13.35

NONFERROUS METALS

Copper, del. Conn.	18.50	18.50	18.50	23.375	12.00
Zinc, E. St. Louis	10.25	10.00	9.75	16.00	8.25
Lead, St. Louis	10.30	10.30	11.80	16.825	6.35
Tin, New York	76.50	77.75	74.125	103.00	52.00
Aluminum, del.	17.00	17.00	17.00	17.00	15.00
Antimony, Laredo, Tex.	24.50	24.50	24.50	38.50	15.00
Nickel, refinery, duty paid	40.00	40.00	40.00	40.00	35.00

Pig Iron

For key to producing companies, turn next page.
Minimum delivered prices do not include 3% federal tax.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$48.00	$48.50	$49.00	$49.50
Newark, del	50.63	51.13	51.63	52.13
Brooklyn, N.Y., del.	....	52.79	53.29	....
Birmingham District				
Birmingham R2	41.88	42.38	....	....
Birmingham S9	41.88	42.38	....	....
Woodward, Ala W15	41.88	42.38	....	....
Cincinnati, del	....	49.08	....	....
Buffalo District				
Buffalo H1, R2	46.00	46.50	47.00	....
Tonawanda, N.Y., W12	46.00	46.50	47.00	....
N. Tonawanda, N.Y., T9	....	46.50	47.00	....
Boston, del	55.26	55.76	56.20	....
Rochester, N.Y., del.	48.63	49.13	49.63	....
Syracuse, N.Y., del.	49.58	50.08	50.58	....
Chicago District				
Chicago I-3	46.00	46.50	46.50	47.00
Gary, Ind. C3	46.00	....	46.50	....
Indiana Harbor, Ind. I-2	46.00	....	46.50	....
So. Chicago, Ill. W14 Y1	46.00	46.50	46.50	....
So. Chicago, Ill C3	46.00	....	46.50	47.00
Milwaukee, del.	47.89	48.39	48.39	48.89
Muskegon, Mich., del.	....	51.98	51.98	....
Cleveland District				
Cleveland A7	46.00	46.50	46.50	47.00
Cleveland R2	46.00	46.50	46.50	....
Akron, del. from Cleve.	48.39	48.89	48.89	49.39
Lorain, O. N3	46.00	....	....	47.00
Duluth I-3	....	....	46.50	....
Erie, Pa. I-3	46.00	46.50	46.50	47.00
Everett, Mass. E1	....	50.50	51.00	....
Fontana, Calif. K1	52.00	52.50	....	....
Geneva, Utah G1	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.	....	54.20	....	....
Portland, Oreg., del.	....	54.20	....	....
Los Angeles, San Francisco, del	53.70	54.20	....	....
Granite City, Ill. M10	47.90	48.40	48.90	....
St. Louis, del (incl. tax)	48.65	49.15	49.65	....
Ironton, Utah C11	46.00	46.50	....	....
Minnequa, Colo. C10	47.00	47.50	47.50	....
Pittsburgh District				
Neville Island, Pa. P6	46.00	46.50	46.50	47.00
Pitts, N.&S. sides, Ambridge, Aliquippa, del.	47.19	47.69	47.69	48.19
McKees Rock, del.	46.95	47.45	47.45	47.95
Lawrenceville, Homestead, McKeesport, Monaca, del.	47.44	47.94	47.94	48.44
Verona, del	47.90	48.40	48.40	48.90
Brackenridge, del.	48.13	48.63	48.63	49.13
Bessemer, Pa. C3	46.00	....	46.50	47.00
Clairton, Rankin, So. Duquesne, Pa. C3	46.00	....	....	....
McKeesport, Pa. N3	46.00	....	....	47.00
Sharpsville, Pa. S6	46.00	46.50	46.50	47.00
Steelton, Pa. B2	48.00	48.50	49.00	49.50
Steubenville, O. W10	46.00	....	....	....
Struthers, O. S16	46.00	....	....	....
Swedeland, Pa. A3	48.00	48.50	49.00	49.50
Philadelphia, del.	49.44	49.94	50.44	50.94
Toledo, O. I-3	46.00	46.50	46.50	47.00
Cincinnati, del.	51.01	51.51	....	....
Troy, N.Y., R2	48.00	48.50	49.00	49.50
Youngstown District				
Hubbard, O. Y1	46.00	46.50	46.50	....
Youngstown C3	46.00	....	....	47.00
Youngstown Y1	46.00	46.50	46.50	47.00
Mansfield, O. del.	50.26	50.76	50.76	51.26

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.5% Si to 11.50%)

Jackson, O. G2, J1	$57.00
Buffalo H1	58.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for 0.045% max. P)

Niagara Falls, N.Y. P15	$71.50
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	77.00
Keokuk, Iowa, OH & Fdry., 12½ lb. piglets, frt, allowed K2.	82.00
Wenatchee, Wash., OH & Fdry, frt. allowed K2	77.00

CHARCOAL PIG IRON, Gross Ton

(Low phos. semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles Tenn. T3	$60.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$51.00
Steelton, Pa. B2	54.00
Philadelphia delivered	57.00
Troy, N.Y. R2	54.00

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Semifinished and Finished Steel Products

Mill prices as reported to STEEL, Mar. 30, 1950; cents per pound unless otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Detroit R7 ..... $50.00
Munhall,Pa. C3 ..... 50.00

INGOTS, Alloy (NT)
Detroit R7 ..... $51.00
Houston,Tex. S5 ..... 59.00
Midland,Pa. C18 ..... 51.00
Munhall,Pa. C3 ..... 51.00
SoDuquesne,Pa. C3 ... 51.00

BILLETS, BLOOMS & Slabs
Carbon, Rerolling (NT)
Bessemer,Pa. C3 .... $53.00
Clairton,Pa. C3 ..... 53.00
Conshohocken,Pa. A3 . 58.00
Ensley,Ala. T2 ..... 53.00
Fairfield,Ala. T2 ..... 53.00
Fontana,Cal. K1 ..... 72.00
Gary,Ind. C3 ..... 53.00
Johnstown,Pa. B2 .... 53.00
Lackawanna,N.Y. B2 . 53.00
Munhall,Pa. C3 ..... 53.00
Sharon,Pa. S3 ..... 57.00
SoChicago,Ill. C3 .... 53.00
So.Duquesne,Pa. C3 .. 53.00

Carbon, Forging (NT)
Bessemer,Pa. C3 .... $63.00
Buffalo R2 ..... 63.00
Canton,O. R2 ..... 63.00
Clairton,Pa. C3 ..... 63.00
Cleveland R2 ..... 63.00
Conshohocken,Pa. A3 . 65.00
Detroit R7 ..... 63.00
Ensley,Ala. T2 ..... 63.00
Fairfield,Ala. T2 .... 63.00
Fontana,Calif. K1 .... 80.00
Gary,Ind. C3 ..... 63.00
Geneva,Utah G1 ..... 63.00
Houston,Tex. S5 ..... 71.00
Ind.Harbor,Ind. I-2 .... 63.00
Johnstown,Pa. B2 .... 63.00
Lackawanna,N.Y. B2 .. 63.00
LosAngeles B3 ..... 82.00
Munhall,Pa. C3 ..... 63.00
Seattle B3 ..... 82.00
So.Chicago C3,R2,W14 . 63.00
So.Duquesne,Pa. C3 ... 63.00
So.SanFrancisco B3 ... 82.00
Warren,O. C17 ..... 63.00

Alloy (NT)
Bethlehem,Pa. B2 .... $66.00
Buffalo R2 ..... 66.00
Canton,O. R2, T7 .... 66.00
Conshohocken,Pa. A3 . 68.00
Detroit R7 ..... 66.00
Fontana,Calif. K1 .... 85.00
Gary,Ind. C3 ..... 66.00
Houston,Tex. S5 ..... 74.00
Ind.Harbor,Ind. Y1 .... 66.00
Johnstown,Pa. B2 .... 66.00
Lackawanna,N.Y. B2 .. 66.00
LosAngeles B3 ..... 86.00
Massillon,O. R2 ..... 66.00
Midland,Pa. C18 ..... 66.00
Munhall,Pa. C3 ..... 66.00
Sharon,Pa. S3 ..... 66.00
So.Chicago C3,R2,W14 . 66.00
So.Duquesne,Pa. C3 .. 66.00
Warren,O. C17 ..... 66.00
Youngstown Y1 ..... 66.00

SHEET BARS (NT)
Mansfield,O. E6 ..... $58.00
Sharon,Pa. S3 ..... 57.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 ..... $76.00
Cleveland R2 ..... 76.00
Ind.Harbor,Ind. I-2 .... 76.00
Massillon,O. R2 ..... 76.00
So.Chicago,Ill. R2 .... 76.00

SKELP
Aliquippa,Pa. J5 ..... 3.25
Munhall,Pa. C3 ..... 3.15
Warren,O. R2 ..... 3.15
Youngstown C3, R2 ... 3.15

WIRE RODS
AlabamaCity,Ala. R2 .. 3.85
Buffalo W12 ..... 3.85
Cleveland A7 ..... 3.85
Donora,Pa. A7 ..... 3.85
Fairfield,Ala. T2 ..... 3.85
Houston,Tex. S5 ..... 4.25
Ind.Harbor,Ind. Y1 .... 3.85
Johnstown,Pa. B2 ..... 3.85
Joliet,Ill. A7 ..... 3.85
LosAngeles B3 ..... 4.65
Minnequa,Colo. C10 .... 4.10
Monessen,Pa. P7 ..... 3.85
No.Tonawanda,N.Y. B11 . 4.10
Pittsburg,Calif. C11 ... 4.50
Portsmouth,O. P12 .... 3.85
Roebling,N.J. R5 ..... 3.95
So.Chicago,Ill. R2 ..... 3.85
SparrowsPoint B2 ..... 3.95
Sterling,Ill.(1) N15 .... 3.85
Struthers,O. Y1 ..... 3.85
Torrance,Calif. C11 .... 4.65

STRUCTURALS
Carbon Steel Stand. Shapes
Aliquippa,Pa. J5 ..... 3.40
Bessemer,Ala. T2 ..... 3.40
Bethlehem,Pa. B2 ..... 3.45
Clairton,Pa. C3 ..... 3.40
Fairfield,Ala. T2 ..... 3.40
Fontana,Calif. K1 ..... 4.00
Gary,Ind. C3 ..... 3.40
Geneva,Utah G1 ..... 3.40
Houston,Tex. S5 ..... 3.80
Ind.Harbor,Ind. I-2 ... 3.40
Johnstown,Pa. B2 ..... 3.45
KansasCity,Mo. S5 .... 4.00
Lackawanna,N.Y. B2 .. 3.45
LosAngeles B3 ..... 4.00
Minnequa,Colo. C10 ... 3.75
Munhall,Pa. C3 ..... 3.40
Niles,Calif.(22) P1 .... 4.02
Phoenixville,Pa. P4 .... 3.30
Portland,Oreg. O4 ..... 3.90
Seattle B3 ..... 4.05
So.Chicago,Ill. C3, W14 . 3.40
So.SanFrancisco B3 ... 3.95
Torrance,Calif. C11 ... 4.00
Weirton,W.Va. W6 .... 3.40

Alloy Stand. Shapes
Clairton,Pa. C3 ..... 4.05
Fontana,Calif. K1 ..... 5.25
Munhall,Pa. C3 ..... 4.05
So.Chicago,Ill. C3 ..... 4.05

H.-S. Low-Alloy Stand. Shapes
Aliquippa,Pa. J5 ..... 5.15
Bessemer,Ala. T2 ..... 5.15
Bethlehem,Pa.(14) B2 .. 5.20
Clairton,Pa. C3 ..... 5.15
Fairfield,Ala. T2 ..... 5.15
Fontana,Calif. K1 ..... 5.75
Gary,Ind. C3 ..... 5.15
Ind.Harbor,Ind. I-2, Y1 . 5.15
Johnstown,Pa. B2 ..... 5.20
Lackawanna,N.Y.(14)B2 5.20
Munhall,Pa. C3 ..... 5.15
So.Chicago,Ill. C3 ..... 5.15
Struthers,O. Y1 ..... 5.15

Wide Flange
Bethlehem,Pa. B2 ..... 3.45
Lackawanna,N.Y. B2 .. 3.45
Munhall,Pa. C3 ..... 3.40
So.Chicago,Ill. C3 ..... 3.40

H-S., L-A. Wide Flange
Munhall,Pa. C3 ..... 5.10
So.Chicago,Ill. C3 ..... 5.10

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 .... 4.20
Lackawanna,N.Y. B2 .. 4.20
Munhall,Pa. C3 ..... 4.20
So.Chicago,Ill. C3 ..... 4.20
Weirton,W.Va. W6 .... 4.20

PLATES, Carbon Steel
AlabamaCity,Ala. R2 .. 3.50
Aliquippa,Pa. J5 ..... 3.50
Ashland,Ky.(15) A10 .. 3.50
Bessemer,Ala. T2 ..... 3.50
Clairton,Pa. C3 ..... 3.50
Claymont,Del. W16 .... 5.60
Cleveland J5, R2 ..... 3.50
Coatesville,Pa. L7 .... 3.60
Conshohocken,Pa. A3 .. 3.60
Ecorse,Mich. G5 ..... 3.75
Fairfield,Ala. T2 ..... 3.50
Fontana,Calif. K1 ..... 4.10
Gary,Ind. C3 ..... 3.50
Geneva,Utah G1 ..... 3.50
Harrisburg,Pa. C5 ..... 3.50
Houston,Tex. S5 ..... 3.90
Ind.Harbor,Ind. I-2, Y1 . 3.50
Johnstown,Pa. B2 ..... 3.50
Lackawanna,N.Y. B2 .. 3.50
Minnequa, Colo. C10 .... 4.30
Munhall,Pa. C3 ..... 3.50
Pittsburgh J5 ..... 3.50
Seattle B3 ..... 4.40
Sharon,Pa. S3 ..... 3.50
So.Chicago,Ill. C3, W14 . 3.50
SparrowsPoint,Md. B2 .. 3.50
Steubenville,O. W10 ... 3.50
Warren,O. R2 ..... 3.50
Weirton,W.Va. W6 .... 3.50
Youngstown C3, R2, Y1 . 3.50

PLATES (Universal Mill)
Fontana,Calif. K1 .... 4.40

PLATES, Carbon, A.R.
Fontana,Calif. K1 ..... 5.25

PLATES, Open-Hearth Alloy
Coatesville,Pa. L7 ..... 4.50
Conshohocken,Pa. A3 .. 4.40
Fontana,Calif. K1 ..... 5.40
Gary,Ind. C3 ..... 4.40
Johnstown,Pa. B2 ..... 4.40
Munhall,Pa. C3 ..... 4.40
Sharon,Pa. S3 ..... 4.40
So.Chicago,Ill. C3 ..... 4.40
SparrowsPoint,Md. B2.. 4.40

PLATES, Wrought Iron
Economy,Pa. B14 ..... 7.85

PLATES, High-Strength Low-Alloy
Aliquippa,Pa. J5 ..... 5.35
Bessemer,Ala. T2 ..... 5.35
Clairton,Pa. C3 ..... 5.35
Cleveland J5, R2 ..... 5.35
Conshohocken,Pa. A3 .. 5.35
Ecorse,Mich. G5 ..... 5.60
Fairfield,Ala. T2 ..... 5.35
Fontana,Calif. K1 ..... 5.95
Gary,Ind. C3 ..... 5.35
Geneva,Utah G1 ..... 5.35
Houston,Tex. S5 ..... 5.60
Ind.Harbor,Ind. I-2, Y1 . 5.35
Johnstown,Pa. B2 ..... 5.35
Munhall,Pa. C3 ..... 5.35
Pittsburgh J5 ..... 5.35
Sharon,Pa. S3 ..... 5.35
So.Chicago,Ill. C3 ..... 5.35
SparrowsPoint,Md. B2 .. 5.35
Warren,O. R2 ..... 5.35
Youngstown Y1 ..... 5.35

FLOOR PLATES
Cleveland J5 ..... 4.55
Conshohocken,Pa. A3 .. 4.55
Harrisburg,Pa. C5 ..... 4.55
Ind.Harbor,Ind. I-2 .... 4.55
Munhall,Pa. C3 ..... 4.55
So.Chicago,Ill. C3 ..... 4.55

PLATES, Ingot Iron
Asland,c.l.(15) A10 .... 3.75
Ashland,lcl(15) A10 ... 4.25
Cleveland,cl R2 ..... 4.10
Warren,O.,cl R2 ..... 4.10

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 .. 3.45
Aliquippa,Pa. J5 ..... 3.45
Alton,Ill.(1) L1 ..... 3.45
Ashland,Ky.(17) A10 .. 3.45
Atlanta,Ga. A11 ..... 3.60
Bessemer,Ala. T2 ..... 3.45
Buffalo R2 ..... 3.45
Canton,O. R2 ..... 3.45
Clairton,Pa. C3 ..... 3.45
Cleveland R2 ..... 3.45
Ecorse,Mich. G5 ..... 3.65
Emeryville,Calif. J7 ... 4.20
Fairfield,Ala. T2 ..... 3.45
Fontana,Calif. K1 ..... 4.10
Gary,Ind. G3 ..... 3.45
Houston,Tex. S5 ..... 3.85
Ind.Harbor,Ind. I-2, Y1 . 3.45
Johnstown,Pa. B2 ..... 3.45
KansasCity,Mo. S5 .... 4.05
Lackawanna,N.Y. B2 .. 3.45
LosAngeles B3 ..... 4.15
Marion,O. P11 ..... 3.35
Midland,Pa. C18 ..... 3.45
Milton,Pa. B6 ..... 3.45
Minnequa,Colo. C10 ... 3.85
Niles,Calif. P1 ..... 4.17
N.Tonawanda,N.Y.B11 . 3.45
Pittsburg,Calif. C11 ... 4.15
Pittsburgh J5 ..... 3.45
Portland,Oreg. O4 ..... 4.20
Seattle B3, N14 ..... 4.20
SoChicago C3, R2, W14 . 3.45
So.Duquesne,Pa. C3 ... 3.45
S.SanFran.,Cal. B3 .... 4.20
Struthers,O. Y1 ..... 3.45
Torrance,Calif. C11 ... 4.15
Weirton,W.Va. W6 .... 3.45
Youngstown C3, R2 ... 3.45

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 ..... 3.45
Atlanta A11 ..... 3.60
Johnstown,Pa. B2 ..... 3.45
Lackawanna,N.Y. B2 .. 3.45
Niles,Calif. P1 ..... 4.17
Pittsburgh(23) J5 ..... 3.45
Portland,Oreg. O4 ..... 4.20
SanFrancisco S7 ..... 4.00
Weirton,W.Va. W6 .... 3.45

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 ..... 3.65

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ..... 3.95
Buffalo R2 ..... 3.95
Canton,O. R2, T7 ..... 3.95
Clairton,Pa. C3 ..... 3.95
Ecorse,Mich. G5 ..... 4.25
Fontana,Calif. K1 .... 4.95
Gary,Ind. C3 ..... 3.95
Houston,Tex. S5 ..... 4.35
Ind.Harbor,Ind. I-2, Y1 . 3.95
Johnstown,Pa. B2 ..... 3.95
KansasCity,Mo. S5 .... 4.55
Lackawanna,N.Y. B2 .. 3.95
LosAngeles B3 ..... 5.00
Massillon,O. R2 ..... 3.95
Midland,Pa. C18 ..... 3.95
So.Chicago C3, R2, W14 . 3.95
So.Duquesne,Pa. C3 ... 3.95
Struthers,O. Y1 ..... 3.95
Warren,O. C17 ..... 3.95
Youngstown C3 ..... 3.95

BARS, Hot-Rolled Ingot Iron
Ashland,Ky.(17) A10 .. 3.70

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 ..... 5.20
Bessemer,Ala. T2 ..... 5.20
Bethlehem,Pa. B2 ..... 5.20
Clairton,Pa. C3 ..... 5.20
Cleveland R2 ..... 5.20
Ecorse,Mich. G5 ..... 5.40
Fairfield,Ala. T2 ..... 5.20
Fontana,Calif. K1 .... 6.25
Gary,Ind. C3 ..... 5.20
Ind.Harbor,Ind. I-2, Y1-5.20
Johnstown,Pa. B2 ..... 5.20
Lackawanna,N.Y. B2 .. 5.20
Pittsburgh J5 ..... 5.20
So.Duquesne,Pa. C3 ... 5.20
Struthers,O. Y1 ..... 5.20
Youngstown C3 ..... 5.20

BARS, Cold-Finished Carbon
Aliquippa,Pa. K5 ..... 4.15
Ambridge,Pa. W18 .... 4.15
BeaverFalls,Pa. M12,R2 . 4.15
Buffalo B5 ..... 4.15
Camden,N.J. P13 ..... 4.63
Carnegie,Pa. C12 ..... 4.15
Chicago W18 ..... 4.15
Cleveland A7, C20 .... 4.15
Detroit P17 ..... 4.30
Donora,Pa. A7 ..... 4.15
Ecorse,Mich. G5 ..... 4.35
Elyria,O. W8 ..... 4.15
FranklinPark,Ill. N5 .. 4.15
Gary,Ind. R2 ..... 4.15
Hammond,Ind. L2, M13 . 4.15
Hartford,Conn. R2 .... 4.55
Harvey,Ill. B5 ..... 4.15
LosAngeles R2 ..... 5.55
Mansfield,Mass. B5 .... 4.55
Massillon,O. R2, R8 .... 4.15
Midland,Pa. C18 ..... 4.15
Monaca,Pa. S17 ..... 4.15
Newark,N.J. W18 ..... 4.55
Plymouth,Mich. P5 .... 4.40
Pittsburgh J5 ..... 4.10
Putnam,Conn. W18 .... 4.55
Readville,Mass. C14 .... 4.55
St.Louis,Mo. M5 ..... 4.55
So.Chicago,Ill. W14 .... 4.15
SpringCity,Pa.(5) K3 .. 4.55
Struthers,O. Y1 ..... 4.15
Waukegan,Ill. A7 ..... 4.15
Youngstown F3, Y1 .... 4.15

BARS, Cold-Finished Alloy
Aliquippa,Pa. K5 ..... 4.90
Ambridge,Pa. W18 .... 4.90
BeaverFalls,Pa. M12 .. 4.90
Bethlehem,Pa. B2 ..... 4.90
Buffalo B5 ..... 4.90
Canton,O. R2, T7 ..... 4.90
Carnegie,Pa. C12 ..... 4.90
Chicago W18 ..... 4.90
Cleveland A7, C20 .... 4.90
Detroit P17 ..... 5.05
Donora,Pa. A7 ..... 4.90
Elyria,O. W8 ..... 4.90
Gary,Ind. R2 ..... 4.90
Hammond,Ind. L2, M13. 4.90
Hartford,Conn. R2 .... 5.20
Harvey,Ill. B5 ..... 4.90
Lackawanna,N.Y. B2 .. 4.90
Mansfield,Mass. B5 .... 5.20
Massillon,O. R2, R8 .... 4.90
Midland,Pa. C18 ..... 4.90
Monaca,Pa. S17 ..... 4.90
Newark,N.J. W18 ..... 5.20
Plymouth,Mich. P5 .... 5.10
So.Chicago,Ill. R2, W14. 4.90
Struthers,O. Y1 ..... 4.90
Waukegan,Ill. A7 ..... 4.90
Warren,O. C17 ..... 4.90
Worcester,Mass. A7 .... 5.20
Youngstown F3, Y1.... 4.90

RAIL STEEL BARS
ChicagoHts.,Ill.(3) I-2.. 3.30
ChicagoHts.,Ill.(4) I-2.. 3.45
FortWorth,Tex.(26) T4.. 4.33
Huntngtn,W.Va.(3) W7.. 3.45
Moline,Ill.(3) R2 ..... 3.40
SouthAvis,Pa.(2) J8 .. 3.30
SouthAvis,Pa.(41) J8 .. 3.30
SouthAvis,Pa.(42) J8 .. 3.30
Williamsport(2,3) S19 .. 3.45

BARS, Wrought Iron
Economy,Pa.(S.R.) B14. 9.50
Economy,Pa.(D.R.)B14 11.00
Economy(Staybolt) B14. 11.30
Dover,N.J.(Staybolt)U1 15.00
Dover(Eng. Bolt) U1 .. 13.50
Dover(Wrgh. Iron) U1 . 12.25
McK.Rks.(S.R.) L5 .... 8.80
McK.Rks.(D.R.) L5 .... 11.25
McK.Rks.(Staybolt) L5. 12.75

BARS, Reinforcing (Fabricated; to Consumers)
Huntington,W.Va. W7 .. 4.50
Johnstown, ¼-1" B2 .. 4.35
LosAngeles B3 ..... 5.00
Marion,O. P11 ..... 4.25
Seattle B3, N14 ..... 5.10
SouthAvis,Pa. J8 ..... 4.35
So.SanFrancisco B3 .... 5.00
SparrowsPt., ¼-1" B2 .. 4.35
Williamsport,Pa. S19 .. 4.35

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 .. 3.45
Alton,Ill.(6) L1 ..... 3.45
Atlanta,Ga. A11 ..... 3.60
Buffalo R2 ..... 3.45
Cleveland R2 ..... 3.45
Emeryville,Calif. J7 .... 4.20
Fairfield,Ala. T2 ..... 3.45
Fontana,Calif. K1 ..... 4.10
Gary,Ind. C3 ..... 3.45
Houston,Tex. S5 ..... 3.85
Ind.Harbor,Ind. I-2, Y1. 3.45
Johnstown,Pa. B2 ..... 3.45
KansasCity,Mo. S5 .... 4.05
Lackawanna,N.Y. B2 .. 3.45
LosAngeles B3 ..... 4.15
Milton,Pa. B6 ..... 3.45
Minnequa,Colo. C10 .... 4.25
Niles,Calif. P1 ..... 4.17
Pittsburg,Calif. C11 .... 4.15
Pittsburgh J5 ..... 3.45
Portland,Oreg. O4 ..... 4.20
SandSprings,Okla. S5 .. 4.35
Seattle,Wash. B3, N14.. 4.20
SouthAvis,Pa. J8 ..... 3.45
So.Chicago,Ill. R2 ..... 3.45
So.Duquesne,Pa. C3 .... 3.45
So.SanFrancisco B3 .... 4.20
SparrowsPoint,Md. B2.. 3.45
Struthers,O. Y1 ..... 3.45
Torrance,Calif. C11 .... 4.15
Youngstown C3, R2.... 3.45

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. C3 ..... 4.20
Fontana,Calif. K1 .... 4.95
Gary,Ind. C3 ..... 4.20
Youngstown C3 ..... 4.20

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 .. 3.35
Ashland,Ky.(8) A10 ... 3.35
Butler,Pa. A10 ..... 3.35
Cleveland J5, R2 ..... 3.35
Conshohocken,Pa. A3 .. 3.45
Ecorse,Mich.(8) G5 .... 3.55
Fairfield,Ala. T2 ..... 3.35
Fontana,Calif. K1 .... 4.25
Gary,Ind. C3 ..... 3.35
Ind.Harbor,Ind. I-2, Y1. 3.35
Irvin,Pa. C3 ..... 3.35
Lackawanna,N.Y. B2 .. 3.35
Munhall,Pa. C3 ..... 3.35
Niles,O. N12 ..... 3.50
Niles,O. M4 ..... 3.75
Pittsburg,Calif. C11 ... 4.05
Pittsburgh J5 ..... 3.35
Sharon,Pa. S3 ..... 3.35
So.Chicago,Ill. W14 .... 3.35
SparrowsPoint,Md. B2 .. 3.35
Steubenville,O. W10 ... 3.35
Torrance,Calif. C11 .... 4.05
Warren,O. R2 ..... 3.35
Weirton,W.Va. W6 .... 3.35
Youngstown C3, Y1 .... 3.35

SHEETS, Hot-Rolled Carbon Steel (19 gage and lighter)
AlabamaCity,Ala. R2 .. 4.50
Dover,O. R1 ..... 4.65
Ind.Harbor,Ind. I-2 .... 4.40
Mansfield,O. E6 ..... 4.15
Niles,O. N12 ..... 4.10
Niles,O. M4 ..... 4.65
Torrance,Calif. C11 .... 5.15

SHEETS, H-R (14 ga., heavier) High-Strength Low-Alloy
Cleveland J5, R2 ..... 5.05
Conshohocken,Pa. A3 .. 5.05
Ecorse,Mich. G5 ..... 5.25
Fairfield,Ala. T2 ..... 5.05
Fontana,Calif. K1 .... 6.74
Gary,Ind. C3 ..... 5.05
Ind.Harbor,Ind. I-2, Y1. 5.05
Irvin,Pa. C3 ..... 5.05
Lackawanna(35) B2 ... 5.05
Pittsburgh J5 ..... 5.05
Sharon,Pa. S3 ..... 5.05
So.Chicago,Ill. C2 ..... 5.05
SparrowsPoint(36) B2 .. 5.05
Warren,O. R2 ..... 5.05
Weirton,W.Va. W6 .... 5.05
Youngstown, C3, Y1 .... 5.05

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 ..... 6.20
Ecorse,Mich. G5 ..... 6.40
Fontana,Calif. K1 .... 7.05
Gary,Ind. C3 ..... 6.20
Ind.Harbor,Ind. I-2, Y1. 6.20
Irvin,Pa. C3 ..... 6.20
Lackawanna(37) B2 ... 6.20
Pittsburgh J5 ..... 6.20
Sharon,Pa. S3 ..... 6.20
SparrowsPoint(38) B2 .. 6.20
Warren,O. R2 ..... 6.20
Weirton,W.Va. W6 .... 6.20
Youngstown Y1 ..... 6.20

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.10
Cleveland J5, R2	4.10
Ecorse,Mich. G5	4.30
Fairfield,Ala. T2	4.10
Follansbee,W.Va. F4	4.10
Fontana,Calif. K1	5.00
Gary,Ind. C3	4.10
GraniteCity,Ill. G4	4.30
Ind.Harbor,Ind. I-2, Y1	4.10
Irvin,Pa. C3	4.10
Lackawanna,N.Y. B2	4.10
Middletown,O. A10	4.10
Pittsburg,Calif. C11	5.05
Pittsburgh J5	4.10
SparrowsPoint,Md. B2	4.10
Steubenville,O. W10	4.10
Warren,O. R2	4.10
Weirton,W.Va. W6	4.10
Youngstown Y1	4.10

SHEETS, Gal'zd No. 10 Steel

AlabamaCity,Ala. R2	4.40
Ashland,Ky.(8) A10	4.40
Canton,O. R2	4.40
Delphos,O. N16	5.15
Dover,O. R1	4.75
Fairfield,Ala. T2	4.40
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Kokomo,Ind. C16	4.50
MartinsFerry,O. W10	4.40
Niles,O. N12	4.65
Pittsburg,Calif. C11	5.15
SparrowsPoint,Md. B2	4.40
Steubenville,O. W10	4.40
Torrance,Calif. C11	5.15
Weirton,W.Va. W6	4.40

SHEETS, Galvanized No. 10, High-Strength Low Alloy

Irvin,Pa. C3	6.75
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	4.95
Irvin,Pa. C3	4.95
Kokomo,Ind. C16	5.05
Niles,O. N12	5.20

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	4.65
Middletown,O. A10	4.65

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.25
Niles,O. R2 (28)	5.25
Weirton,W.Va. W6	5.10

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.05

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va. W10	4.80
Gary,Ind. C3	4.80
Mansfield,O. E6	4.80
Middletown,O. A10	4.80
Niles,O. N12	4.80
Weirton,W.Va. W6	4.80

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.20

ROOFING SHORT TERNES (Package; 8 lb coated)

Gary,Ind. C3	17.50
Yorkville, O. W10	17.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	6.60
Gary,Ind. C3	6.50
Ind.Harbor I-2	6.50
Irvin,Pa. C3	6.50
Yorkville,O. W10	6.50

SHEETS, Lt. Coated Ternes, 6 lb

Yorkville, O. W10	7.05

SHEETS, Mfg. Ternes, 8 lb

Gary,Ind. C3	8.10
Warren,O. R2	8.10
Yorkville,O. W-10	8.10

SHEETS, Coated Ternes, 12 lb

Yorkville,O. W10	8.95

SHEETS, Culvert, No. 16 Corrugated Ingot Iron

	Cu Alloy	Cu Fe
Ashland A10	5.20	...
Canton,O. R2	5.25	5.70
Fairfield,Ala. T2	5.20	5.45
Gary C3	5.20	5.45
IndianaHarbor I-2	5.20	5.45
Irvin,Pa. C3	5.20	5.45
Kokomo C16	5.40	...
MartinsFy,O. W10	5.20	5.45
Pittsburg,Cal. C11	5.95	...
SparrowsPt. B2	5.20	...
Torrance,Cal. C11	5.95	...

SHEETS, Culvert, No. 16 Corrugated Ingot Iron

Ashland,Ky. A10	5.45

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.60
Cleveland R2	3.95
Ind.Harbor,Ind. I-2	3.60
Warren,O. R2	3.95

SHEETS, Cold-Rolled Ingot Iron

Cleveland R-2	4.70
Middletown,O. A10	4.60
Warren,O. R2	4.70

SHEETS, Galvanized Ingot Iron No. 10 Flat

Ashland,Ky.(8) A10	4.65
Canton,O. R2	5.15
Ind.Harbor,Ind. I-2	4.80

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	4.90
Middletown,O. A10	4.90

SHEETS, Well Casing

Torrance,Calif. C11	4.85

SHEETS, Drum Body

Pittsburg,Calif. C11	4.05
Torrance,Calif. C11	4.05

SHEETS, Aluminized

Butler,Pa. A10	7.75

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$6.35	$6.60	$6.85
Fairfield,Ala. T2	6.45	6.70	6.95
Gary,Ind. C3	6.35	6.60	6.85
GraniteCity,Ill. G4	6.55	6.80	7.05
Ind.Harbor,Ind. I-2, Y1	6.35	6.60	6.85
Irvin,Pa. C3	6.35	6.60	6.85
Niles,O. R2	6.35	6.60	6.85
Pittsburg,Calif. C11	7.10	7.35	7.60
SparrowsPoint,Md. B2	6.45	6.70	6.95
Weirton,W.Va. W6	6.35	6.60	6.85
Yorkville,O. W10	6.35	6.60	6.85

SHEETS, SILICON, H.R. or C.R. (22 Ga.) Coils (Cut Lengths ½c lower)

	Field	Armature	Electric	Motor	Dynamo
BeechBottom W10 (cut lengths)	...	...	6.70	7.95	8.75
Brackenridge,Pa. A4	...	...	7.20	8.45	9.25
GraniteCity,Ill. G4(cut lengths)	...	...	6.90	8.15	...
Ind.Harbor,Ind. I-2	6.40	6.70	(34)	...	...
Mansfield,O. E6 (cut lengths)	5.90	6.20	6.70	7.95	8.75
Niles,O. N12 (cut lengths)	...	6.20	6.70	...	...
Niles,O. M4 (24 Gage)	5.65	5.95	6.45	...	...
Parkersburg F4 (cut lengths)	...	...	6.70	7.95	8.75
Vandergrift,Pa. C3	...	6.70	7.20	8.45	9.25
Warren,O. R2	6.40	6.70	7.20	8.45	9.25
Zanesville,O. A10	...	6.70	7.20	8.45	9.25

SHEETS, SILICON (22 Gage Base) Coils (Cut Lengths ½c lower)

Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.30	9.85	10.55	11.35
Brackenridge,Pa. A4	9.80	10.35	11.05	...
Parkersburg F4 (cut lengths)	9.30	...	...	...
Vandergrift,Pa. C3	9.80	10.35	11.05	11.85
Warren,O. R2	9.80	...	...	...
Zanesville,O. A10	9.80	10.35	11.05	11.85

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Vandergrift,Pa. C3	12.35	13.20	14.20	14.70

TIN PLATE, American COKE (Base Box)

	1.25 lb	1.50 lb
Aliquippa J5	$7.30	$7.50
Fairfield,Ala. T2	7.40	7.60
Gary C3	7.30	7.50
Gran.City,Ill. G4	7.50	7.70
Ind.Harbor I-1, Y1	7.30	7.50
Irvin,Pa. C3	7.30	7.50
Pitts.Cal. C11	8.05	8.25
Sp.Pt.,Md. B2	7.40	7.60
Warren R2	7.30	7.50
Weirton W6	7.30	7.50
Yorkville,O. W10.	7.30	7.50

CANMAKING BLACK PLATE (Base Box)

Aliquippa,Pa. J5	5.60
Fairfield,Ala. T2	5.70
Gary,Ind. C3	5.60
GraniteCity,Ill. G4	5.80
Ind.Harbor,Ind. I-2, Y1	5.60
Irvin,Pa. C3	5.60
Niles,O. R2	5.60
Pittsburg,Calif. C11	6.35
SparrowsPoint,Md. B2	5.70
Warren,O. R2	5.60
Weirton,W. Va. W6	5.60
Yorkville,O. W10	5.60

HOLLOWARE ENAMELING Black Plate (29 gage)

Aliquippa,Pa. J5	5.30
Follansbee,W.Va. F4	5.30
Gary,Ind. C3	5.30
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. C3	5.30
Niles,O. R2	5.30
SparrowsPoint,Md. B2	5.40
Warren,O. R2	5.30
Yorkville,O. W10	5.30

SHEETS, Enam'lg. Iron

Ashland,Ky.(8) A10	4.40
Cleveland R2	4.40
Ecorse,Mich. G5	4.70
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Middletown,O. A10	4.40
Niles,O. M4	4.90
Youngstown Y1	4.40

STRIP, Hot-Rolled, High-Strength Low-Alloy

Bessemer,Ala. T2	4.95
Conshohocken,Pa. A3	4.95
Ecorse,Mich. G5	5.15
Fairfield,Ala. T2	4.95
Fontana,Cal. K1	6.64
Gary,Ind. C3	4.95
Ind.Harb.,Ind. I-2, Y1	4.95
Lackawanna,N.Y. B2	4.95
Sharon,Pa. S3	4.95
SparrowsPoint, Md. B2	4.95
Warren,O. R2	4.95
Weirton,W.Va. W6	4.95
Youngstown C3, Y1	4.95

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.10
Carnegie,Pa. S18	5.10
Fontana,Calif. K1	6.30
Gary,Ind. C3	5.10
Houston,Tex. S5	5.50
KansasCity,Mo. S5	5.70
NewBritn,Conn.(10) S15	5.10
Sharon,Pa. S3	5.10
Youngstown C3	5.10

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.50
Warren,O. R2	3.85

STRIP, Hot-Rolled Carbon

Alton,Ill.(1) L1	3.25
Ashland,Ky.(8) A10	3.25
Atlanta A11	3.40
Bessemer,Ala. T2	3.25
Bridgeprt,Conn.(10) S15	3.25
Butler,Pa. A10	3.25
Carnegie,Pa. S18	3.25
Conshohocken,Pa. A3	3.35
Detroit M1	3.45
Ecorse,Mich. G5	3.45
Fairfield,Ala. T2	3.25
Fontana,Calif. K1	4.40
Gary,Ind. C3	3.25
Houston,Tex. S5	3.65
Ind.Harbor,Ind. I-2, Y1	3.25
KansasCity,Mo.(9) S5	3.85
Lackawanna,N.Y. B2	3.25
LosAngeles B3	4.00
Milton,Pa. B6	3.25
Minnequa,Colo. C10	4.30
NewBritain(10) S15	3.25
N.Tonawanda,N.Y. B11	3.25
Pittsburg,Calif. C11	4.00
Riverdale,Ill. A1	3.25
SanFrancisco S7	3.90
Seattle B3, N14	4.25
Sharon,Pa. S3	3.25
So.Chicago,Ill. W14	3.25
So.SanFrancisco B3	4.00
SparrowsPoint,Md. B2	3.25
Torrance,Calif. C11	4.00
Warren,O. R2	3.25
Weirton,W.Va. W6	3.25
WestLeechburg,Pa. A4	3.25
Youngstown C3, Y1	3.25

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10) S15	9.50
Carnegie,Pa. S18	9.50
Cleveland A7	9.50
Dover,O. G6	9.50
Harrison,N.J. C18	9.80
NewBritn,Conn.(10) S15	9.50
Pawtucket,R.I.(11) N8	9.50
Pawtucket,R.I.(12) N8	9.80
Sharon,Pa. S3	9.50
Worcester,Mass. A7	9.80
Youngstown C8	9.50

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	4.75

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.25-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Bridgeport,Conn.(10) S15	4.15	5.95	6.55	8.50	10.80
Bristol,Conn. W1	...	...	6.40	8.35	...
Carnegie,Pa. S18	...	5.95	6.55	8.50	10.80
Cleveland A7	4.15	5.95	6.55	8.50	10.80
Dover,O. G6	4.15	5.95	6.55	8.50	10.80
FranklinPark,Ill. T6	4.40	6.10	6.70	8.65	...
Harrison,N.J. C18	...	...	6.85	8.80	11.10
Mattapan,Mass. T6	4.65	6.25	6.85	8.80	11.10
NewBritn.,Conn.(10) S15	4.15	5.95	6.55	8.50	10.80
NewCastle,Pa. B4	4.15	5.95	6.55	8.50	...
NewCastle,Pa. E5	4.15	5.95	6.55	8.50	10.80
NewYork W3	...	6.30	6.90	8.85	11.15
Pawtucket,R. I. N8:					
Cleve.orPitts.Base (29)	4.55	5.50	6.10	8.05	10.35
Worcester,Base (29)	4.50	5.80	6.40	8.35	10.65
Sharon,Pa. S3	4.15	5.95	6.55	8.50	10.80
Trenton,N.J. R5	...	6.25	6.85	8.80	11.10
Wallingford,Conn. W2	4.65	6.25	6.85	8.80	11.10
Weirton,W.Va. W6	4.15	5.95	6.55	8.50	10.80
Worcester,Mass. A7	4.45	6.25	6.85	8.80	11.10
Worcester,Mass. T6	4.65	6.25	6.85	8.80	11.10
Youngstown C8	4.50	5.95	6.55	8.50	10.80
Spring Steel (Tempered)					
Trenton,N.J. R5	...	...	9.30	11.25	13.85
Harrison,N.J. C18	...	...	9.30	11.25	13.85

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	4 15
Berea,O. C7	6 60
Bridgprt,Conn.(10) S15	4 15
Butler,Pa. A10	4.15
Cleveland A7, J5	4.15
Dearborn,Mich. D3	4.40
Detroit, D2	4.40
Detroit M1	4.35
Dover,O.(40) G6	4.15
Ecorse,Mich. G5	4.35
Follansbee,W.Va. F4	4.15
Fontana,Calif. K1	5.40
FranklinPark,Ill. T6	4.30
Ind.Harbor,Ind. I-2	4.30
Lackawanna,N.Y. B2	4.15
LosAngeles C1	5.50
Mattapan,Mass.(21) T6	4.65
Middletown,O. A10	4.15
NewBritain(10) S15	4.15
NewCastle,Pa. B4, E5	4.15
NewHaven,Conn. A7, D2	4.65
NewYork W3	5.00
Pawtucket,R.I.(11) N8	4.70
Pawtucket,R.I.(21) N8	4.65
Riverdale,Ill. A1	4.30
Rome,N.Y. R6	4.15
Sharon,Pa.(30) S3	4.15
SparrowsPoint,Md. B2	4.15
Trenton,N.J. (13) R5	4.65
Wallingford,Conn. W2	4.65
Warren,O.(25) T5	4.15
Warren,O. R2	4.15
Weirton,W.Va. W6	4.15
Youngstown C8, Y1	4.15

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland A7, J5	6.20
Dover,O. G6	6.20
Ecorse,Mich. G5	6.40
Fontana,Calif. K1	6.95
Lackawanna,N.Y., B2	6.40
Sharon,Pa. S3	6.20
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.20
Weirton,W. Va. W6	6.20
Youngstown Y1	6.20

STRIP, Electro Galvanized

Weirton,W.Va. W6	4.15
Youngstown C8	4.15

Key to Producing Companies

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel&Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth.Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bolardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B14 A. M. Byers Co.

C1 Calif. Cold Rolled Steel
C3 Carnegie-Illinois Steel
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Clev. Cld.Roll.Mills Co.
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Son, Henry
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F6 Fretz-Moon Tube Co.

G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H4 Heppenstall Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K5 Kidd Drawn Steel Co.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

TIGHT COOPERAGE HOOP

Atlanta A11	3.60
Riverdale,Ill. A1	3.60
Sharon,Pa. S3	3.60
Youngstown C3	3.60

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	5.90
Alton,Ill.(1) L1	5.90
Bartonville,Ill.(1) K4	5.90
Buffalo W12	5.90
Cleveland A7	5.90
Donora,Pa. A7	5.90
Duluth A7	5.90
Fostoria,O. S1	5.90
Johnstown,Pa. B2	5.90
LosAngeles B3	6.85
Milbury,Mass(12) N6	6.20
Monessen,Pa. P7, P16	5.90
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
SparrowsPoint,Md. B2	6.00
Struthers,O. Y1	5.90
Trenton,N.J., A7	6.20
Waukegan,Ill. A7	5.90
Worcester A7,J4,T6,W12	6.20

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	5.35
Buffalo W12	5.35
Cleveland A7	5.35
Crawfordsville,Ind. M8	5.35
Dover,O. G6	5.35
Fostoria,O. S1	5.50
Kokomo,Ind. C16	5.35
FranklinPark,Ill. T6	5.70
Massillon,O. R8	5.35
Monessen,Pa. P7, P16	5.35
Pawtucket,R.I.(11) N8	5.70
Pawtucket,R.I.(12) N8	5.65
Trenton,N.J. R5	5.65
Worcester A7, T6, W12	5.65

WIRE, Fine and Weaving (8-in. Coils)

Bartonville,Ill.(1) K4	8.45
Buffalo W12	8.45
Chicago W13	8.45
Cleveland A7	8.45
Crawfordsville,Ind. M8	8.45
Fostoria,O. S1	8.45
Johnstown,Pa. B2	8.45
Kokomo,Ind. C16	8.45
Monessen,Pa. P16	8.45
Palmer,Mass. W12	8.75
Portsmouth,O. P12	8.45
Roebling,N.J. R5	8.75
Waukegan,Ill. A7	8.45
Worcester,Mass. A7, T6	8.75

WIRE, Manufacturers Bright, Low-Carbon

AlabamaCity,Ala. R2	4.50
Aliquippa,Pa. J5	4.50
Atlanta A11	4.60
Alton,Ill.(1) L1	4.50
Bartonville,Ill.(1) K4	4.50
Buffalo W12	4.50
Chicago W13	4.50
Cleveland A7, C20	4.50
Crawfordsville,Ind. M8	4.60
Donora,Pa. A7	4.50
Duluth A7	4.50
Fairfield,Ala. T2	4.50
Fostoria,O.(24) S1	4.85
Houston S5	4.90
Johnstown,Pa. B2	4.50
Joliet,Ill. A7	4.50
KansasCity,Mo. S5	5.10
Kokomo,Ind. C16	4.60
LosAngeles B3	5.45
Minnequa,Colo. C10	4.75
Monessen,Pa. P7	4.50
Newark,6-8ga. I-1	5.15
No.Tonawanda B11	4.90
Palmer,Mass. W12	4.80
Pittsburg,Calif. C11	5.45
Portsmouth,O. P12	4.50
Rankin,Pa. A7	4.50
So.Chicago,Ill. R2	4.50
So.SanFrancisco C10	5.45
SparrowsPoint,Md. B2	4.60
Sterling,Ill.(1) N15	4.50
Struthers,O. Y1	4.50
Torrance,Calif. C11	5.45
Waukegan,Ill. A7	4.50
Worcester,Mass. A7, T6	4.80

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.55
Alton,Ill.(1) L1	5.55
Buffalo W12	5.55
Cleveland A7	5.55
Donora,Pa. A7	5.55
Duluth A7	5.55
Johnstown,Pa. B2	5.55
LosAngeles B3	6.50
Monessen,Pa. P7, P16	5.55
NewHaven,Conn. A7	5.85
Palmer,Mass. W12	5.85
Pittsburg,Calif. C11	6.50
Portsmouth,O. P12	5.55
Roebling,N.J. R5	5.85
So.Chicago,Ill. R2	5.55
SparrowsPoint,Md. B2	5.65
Struthers,O. Y1	5.55
Torrance,Calif. C11	6.50
Trenton,N.J. A7	5.85
Waukegan,Ill. A7	5.55
Worcester,Mass. A7	5.85

ROPE WIRE

	Mild Plow	Plow	Imp. Plow
Bartonville,Ill. K4	8.05	8.05	8.30
Buffalo W12	8.05	8.05	8.30
Cleveland A7	8.05	8.05	8.30
Donora,Pa. A7	8.05	8.05	8.30
Fostoria,O. S1	8.05	8.05	8.30
Johnstown,Pa. B2	8.05	8.05	8.30
Monessen,Pa. P7, P16	8.05	8.05	8.30
NewHaven,Conn. A7	8.35	8.35	8.60
Palmer,Mass. W12	8.05	8.05	8.30
Portsmouth,O. P12	8.05	8.05	8.30
Roebling,N.J. R5	8.35	8.35	8.60
SparrowsPoint,Md. B2	8.15	8.15	8.40
Struthers,O. Y1	8.05	8.05	8.30
Trenton,N.J. A7	8.35	8.35	8.60
Waukegan,Ill. A7	8.05	8.05	8.30
Williamsport,Pa. B2	8.15	8.15	8.40
Worcester,Mass. J4, T6	8.35	8.35	8.60

WIRE, Merchant Quality (6 to 8 gage)

	An'ld	Galv.
AlabamaCity R2	5.35	5.60
Aliquippa J5	5.35	5.60
Atlanta A11	5.45	5.70
Bartonville(19) K4	5.35	5.60
Buffalo(31) W12	4.50	...
Cleveland A7	5.35	5.60
Crawfordsvil. M8	5.45	5.70
Donora A7	5.35	5.60
Duluth A7	5.35	5.60
Fairfield T2	5.35	5.60
Houston,Tex. S5	5.75	6.00
Johnstown B2	5.35	5.60
Joliet,Ill. A7	5.35	5.60
KansasCy,Mo. S5	5.95	6.20
Kokomo C16	5.45	5.70
LosAngeles B3	6.30	...
Minnequa C10	5.60	5.85
Monessen P7	5.35	5.60
Palmer(31) W12	4.80	...
Pitts.,Cal. C11	6.30	6.55
Prtsmth.(18) P12	5.35	5.60
Rankin A7	5.35	5.60
So.Chicago R2	5.35	5.60
So.S.Fran. C10	6.30	6.55
SparrowsPt. B2	5.45	5.70
Sterling,Ill.(1)N15	5.35	5.60
Struthers,O. Y1	5.35	5.60
Torrance,Cal. C11	6.30	...
Worcester A7	5.65	5.90

WIRE (16 gage)

	An'ld. Stone	Galv. Stone
Aliquippa J5	9.80	11.30
Bartonville(1) K4	9.80	11.30
Cleveland A7	9.80	11.30
Crawfrdsvil. M8	9.80	11.30
Fostoria,O. S1	9.90	11.40
Johnstown B2	9.80	11.30
Kokomo C16	9.80	11.30
Minnequa C10	9.40	10.90
Palmer,Mass. W12	9.35	10.85
Pitts.,Cal. C11	10.15	11.65
Prtsmth.(18) P12	9.80	11.30
SparrowsPt. B2	9.90	11.40
Waukegan A7	9.80	11.30

WIRE, Galv'd ACSR for Cores

Monessen,Pa. P16	8.15
Roebling,N.J. R5	8.45
SparrowsPoint,Md. B2	8.25

WIRE, Tire Bead

Monessen,Pa. P16	10.80
Roebling,N.J. R5	10.80

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	126
Aliquippa,Pa. J5	126
Atlanta A11	128
Crawfordsville M8	128
Donora,Pa. A7	126
Duluth,Minn. A7	126
Fairfield,Ala. T2	126
Houston,Tex. S5	134
Johnstown,Pa. B2	126
Joliet,Ill. A7	126
KansasCity,Mo. S5	138
Kokomo,Ind. C16	128
Minnequa,Colo. C10	131
Monessen,Pa. P7	126
Pittsburg,Calif. C11	146
Portsmouth,O.(18) P12	126
Rankin,Pa. A7	126
So.Chicago,Ill. R2	126
So.SanFran.,Calif. C10	146
SparrowsPoint,Md. B2	128
Sterling,Ill.(1) N15	126

FENCE POSTS

	Col.
Duluth A7	116
Huntington,W.Va. W7	116
Johnstown,Pa. B2	116
Joliet,Ill. A7	116
Minnequa,Colo. C10	121
Moline,Ill. R2	112
So.Chicago R2	116
Williamsport,Pa. S19	120

WOVEN FENCE, 9-15½Ga. Col.

AlabamaCity,Ala. R2	116
Ala.City,Ala.,17-18ga.R2	198
Aliquippa,,Pa.9-14½ga.J5	116
Atlanta A11	118
Bartonville,Ill.(19) K4	116
Crawfordsville,Ind. M8	118
Donora,Pa. A7	116
Duluth A7	116
Houston,Tex. S5	124
Fairfield,Ala. T2	116
Johnstown,Pa. B2	116
Johnstn,17ga.6" B2	190
Johnstn,17ga.,4" B2	193
Joliet,Ill. A7	116
KansasCity,Mo. S5	128
Kokomo,Ind. C16	118
Minnequa,Colo. C10	121
Monessen,Pa. P7	116
Pittsburg,Calif. C11	139
Portsmouth,O.(18) P12	116
Rankin,Pa. A7	116
So.Chicago,Ill. R2	116

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	113
Atlanta A11	114
Bartonville,Ill.(19) K4	113
Chicago W13	113
Crawfordsville M8	115
Donora,Pa. A7	113
Duluth A7	113
Fairfield,Ala. T2	113
Joliet,Ill. A7	113
KansasCity,Mo. S5	125
Kokomo,Ind. C16	115
Minnequa,Colo. C10	118
Pittsburg,Calif. C11	137
Portsmouth,O.(18) P12	113
So.Chicago,Ill. R2	113
So.SanFran.,Calif. C10	137
SparrowsPoint,Md. B2	115
Sterling,Ill.(1) N15	113

NAILS & STAPLES, Stock To Dealers & Mfrs. (7)

	Col.
AlabamaCity,Ala. R2	106
Aliquippa,Pa. J5	106
Atlanta A11	108
Bartonville,Ill.(19) K4	106
Chicago,Ill. W13	106
Cleveland A9	112
Crawfordsville,Ind. M8	108
Donora,Pa. A7	106
Duluth A7	106
Fairfield,Ala. T2	106
Galveston,Tex. D7	114
Houston,Tex. S5	114
Johnstown,Pa. B2	106
Joliet,Ill. A7	106
KansasCity,Mo. S5	118
Kokomo,Ind. C16	108
Minnequa,Colo. C10	111
Monessen,Pa. P7	106
Pittsburg,Calif. C11	125
Portsmouth,O. P12	106
Rankin,Pa. A7	106
So.Chicago,Ill. R2	106
SparrowsPoint,Md. B2	108

RAILS

	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb Under
Bessemer,Pa. C3	3.40	3.30	3.35	3.75
Ensley,Ala. T2	3.40	3.30	...	3.75
Fairfield,Ala. T2	...	...	...	3.75
Gary,Ind. C3	3.40	3.30	3.35	...
Huntington,W.Va. W7	...	...	...	3.75
Ind.Harbor,Ind. I-2	3.40	3.30	3.35	...
Johnstown,Pa. B2	...	...	...(16)	3.75
Lackawanna B2	3.40	3.30	...	3.75
Minnequa,Colo. C10	3.40	3.30	...	4.25
Steelton,Pa. B2	3.40	3.30	...	...

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	5.35
Bartonville,Ill.(19) K4	5.35
Crawfordsville,Ind. M8	5.45
Donora,Pa. A7	5.35
Duluth A7	5.35
Johnstown,Pa. B2	5.35
Joliet,Ill. A7	5.35
Kokomo,Ind. C16	5.45
Minnequa,Colo. C10	5.60
Pittsburg,Calif. C11	6.30
Portsmouth,O. P12	5.35
Rankin,Pa. A7	5.35
So.Chicago,Ill. R2	5.35
SparrowsPoint,Md. B2	5.45
Worcester,Mass. A7	5.65

NAILS, Cut (100 lb keg) To dealers (33)

Conshohocken,Pa. A3	$6.75
Wheeling,W.Va. W10	6.75

AXLES

Fairfield,Ala. T2	5.25
Gary,Ind. C3	5.25
Ind.Harbor,Ind. S13	5.25
Johnstown,Pa. B2	5.25
McKeesRocks,Pa. C3	5.25

TIE PLATES

Fairfield,Ala. T2	4.20
Gary,Ind. C3	4.20
Ind.Harbor,Ind. I-2	4.20
Lackawanna,N.Y. B2	4.20
Minnequa,Colo. C10	4.20
Pittsburg,Calif. C11	4.35
Pittsburgh R2	4.20
Seattle B3	4.35
Steelton,Pa. B2	4.20
Torrance,Calif. C11	4.35
Weirton,W.Va. W6	4.20

JOINT BARS

Bessemer,Pa. C3	4.40
Fairfield,Ala. T2	4.40
Ind.Harbor,Ind. I-2	4.40
Joliet,Ill. C3	4.40
Lackawanna,N.Y. B2	4.40
Minnequa,Colo. C10	4.40
Steelton,Pa. B2	4.40

TRACK BOLTS (20) Treated

Fairfield,Ala. T2	9.10
KansasCity,Mo. S5	9.10
Lebanon,Pa.(32) B2	8.85
Minnequa,Colo. C10	8.85
Pittsburgh O3, P14	9.10
Seattle B3	9.35

STANDARD TRACK SPIKES

Fairfield,Ala. T2	5.60
Ind.Harbor,Ind. I-2, Y1	5.60
KansasCity,Mo. S5	5.85
Lebanon,Pa. B2	5.60
Minnequa,Colo. C10	5.60
Pittsburgh J5	5.60
Seattle B3	6.10
So.Chicago,Ill. R2	5.60
Struthers,O. Y1	5.60
Youngstown R2	5.60

TOOL STEEL

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	21.00	18W,4Cr,3V	126.00
Extra Carbon	24.50	18W,4Cr,2V,9Co	185.50
Spec. Carbon	29.50	18W,4Cr,2V,6Co	169.50
Oil Hardening	32.00	18.25W,4.25Cr,1V,4.75Co	156.50
Cr Hot Wrk.	32.00	20.25W,4.25Cr,1.6V,12.25Co	293.50
Hi-Carbon-Cr	57.50	1.5W,4Cr,1V,8.5Mo	71.50
18W,4Cr,1V	100.00	6.4W,4.5Cr,1.9V,5Mo	76.50
18W,4Cr,2V	113.00	6W,4Cr,3V,6Mo	97.00

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H4, J3, L3, M9, M14, R2, S8, T7, U4, V2, V3.

Key to Producing Companies

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M10 Missouri-Illinois Furnace
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.
N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 New EngHighCarb. Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst. Steel Roll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg.Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills.
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div.,EatonMfg.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
U1 Ulster Iron Works
U4 Universal Cyclops Steel
V2 Vanadium Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 Wstrn.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W16 Worth Steel Co.
W18 Wyckoff Steel Co.
Y1 Youngstwn Sheet & Tube

(1) Chicago Base. (2) Angles.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. Base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh Base.
(11) Cleveland & Pittsburgh Base.
(12) Worcester, Mass. Base.
(13) 3"& wider; over ¼" to under 3" 5.15c.
(14) Also wide flange beams.
(15) ¼" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh Base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. Base.
(22) Del. San Fran. Bay area.
(23) Angles 1"x1" to 1¼"x1¼" only.
(24) Deduct 0.35c for finer than 15 Ga.
(25) Up to 0.035 C; 4.40c, 0.035 C and over.
(26) Reinforcing, mill shipments; to consumers, 4.83c; fabricated to fabricators, 4.58c.
(28) Bonderized.
(29) 0.26-0.40 C.
(30) 0.40 C and less.
(31) Not annealed.
(32) Untreated.
(33) To jobbers, deduct 20 cents.
(34) 6.70c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 Ga. & lighter; 60" & narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 4.40c, 0.035" and heavier.
(41) Flats.
(42) Bands.

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	36.5	34.5	35.5	8.5	9	7.5
¼	6.0	0.42	33.5	31.5	32.5	9.5	11	8.5
⅜	6.0	0.57	29	27.	28	5.5	8	4.5
½	8.5	0.85	40.5	38.5	39.5	24.0	22.0	23.0
¾	11.5	1.13	43.5	41.5	42.5	28.0	26.0	27.0
1	17.00	1.68	46.0	44.0	45.0	31.0	29.0	30.0
1¼	23.0	2.28	46.5	44.5	45.5	31.5	29.5	30.5
1½	27.5	2.73	47.0	45.0	46.0	32.0	30	31.0
2	37.0	3.68	47.5	45.5	46.5	32.5	30.5	31.5
2½	58.5	5.82	48.0	46.0	47.0	33.0	31.0	32.0
3	76.5	7.62	48.0	46.0	47.0	33.0	31.0	32.0

Column A: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 1½ percentage points lower on ⅛", 2 points lower on ¼", 3 points lower on ⅜", W10. Wheatland, Pa., 2 pts lower on ⅛" through ⅜", W9. Following make ½" and larger: Lorain, O. N3; Youngstown, plus 42% on 3½" and 4", R2; Youngstown Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11 points lower on ½" and larger continuous weld and 31% on 3½" and 4".

Columns B & E: Sparrows Point Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y-1; Alton, Ill. (Lorain, O., base) L1 quotes 2 points lower on ⅛", ¼", ⅜".

Column D: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa., ⅛" through ⅜", F6; Benwood, W. Va., except 3½ points lower on ⅛", 2½ pts on ¼", 3 pts on ⅜", W10. Wheatland, Pa., except 2 pts lower on ⅛" through ⅜", W9. Following make ½" and larger: Lorain N3; Youngstown, plus 26.5% on 3½" and 4", R2; Youngstown, Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11 points lower on ½" and larger continuous weld and 15.5% on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	36.0	20.5	36.0	20.5
2½	58.5	5.82	39.0	23.5	39.0	23.5
3	76.5	7.62	39.0	23.5	39.0	23.5
3½	92.0	9.20	41.0	25.5	41.0	25.5
4	$1.09	10.89	41.0	25.5	41.0	25.5
5	1.48	14.81	41.0	25.5	41.0	25.5
6	1.92	19.18	41.0	25.5	41.0	25.5

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5; Lorain, O. N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft. inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	12.36	14.39	13.96	13.96
1¼	13	14.63	17.05	14.19	16.54
1½	13	16.17	19.02	15.68	18.45
1¾	13	18.39	21.64	17.84	20.99
2	13	20.61	24.24	19.99	23.51
2¼	13	22.96	27.03	22.27	26.22
2½	12	25.29	29.76	24.53	28.87
2½	12	27.71	32.58	26.88	31.60
2¾	12	29.36	34.53	28.48	33.49
3	12	30.82	36.27	29.90	35.18
3¼	11	35.87	42.22	34.79	40.95
3½	11	38.52	45.35	37.36	43.99
4	10	47.82	56.25	46.39	54.56
4½	9	63.37	74.59	61.47	72.35
5	9	73.37	86.32	71.17	83.73
6	7	112.62	132.51	....	....

Boiler tube producers include Babcock & Wilcox Tube Co., National Tube Co., Globe Steel Tubes Co., Pittsburgh Steel Co., Republic Steel Corp., Standard Tube Co.

CLAD STEELS

(Cents per pound)

Cladding Stainless	Plates Carbon Base 10%	Plates Carbon Base 20%	Strip Cold-Rolled Carbon Base 10% Both sides	Sheets Carbon Base 10%	Sheets Carbon Base 20%	Copper Base Both Sides
302	....	....	....	19.75	21.50–22.50	75.00
304	22.50	26.50	....	20.75	22.50–24.00	77.00
305	....	....	....	....	....	79.00
309	27.00	31.00	....	....	....	....
310	32.50	36.50	....	....	....	105.00
316	27.00	31.00	....	26.00	28.00–32.00	....
317	30.50	34.50	....	....	....	....
318	29.50	33.50	....	....	....	....
321	23.50	27.50	....	23.00	25.00	90.00
347	25.00	29.00	....	24.00	26.00–30.00	94.00
405	18.75	24.75	....	....	....	....
410	18.25	24.25	....	....	....	....
430	18.25	24.25	....	....	....	....
Nickel	27.50	34.50	31.50 41.00	....	....	88.00
Inconel	36.00	46.00	....	....	....	115.00
Monel	29.00	37.00	26.50 33.50	....	....	83.00
Copper*	....	....	19.75† 23.75†	....	....	....

* Dexodized. † Deduct 4.25c for hot-rolled. Production points for carbon base products; Stainless plates and sheets, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. W16 and Coatesville, Pa. L7; nickel, inconel and monel-clad plates, Coatesville L7; nickel, monel and copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:
- ½-in. & smaller diam. 27
- ⅝-in. & ⅝-in. 29
- ¾-in. and larger 26

Longer than 6 in.:
- All diams. 22

Lag bolts, all diams.:
- 6 in. and shorter 30
- over 6 in. long 28

Ribbed Necked Carriage. 26
Blank 40
Plow 40
Step, Elevator, Tap, and Sleigh Shoe 28
Tire bolts 20
Boiler & Fitting-Up Bolts 37

NUTS

H.P. & C.P. Reg. & Heavy Square:	Reg.	Heavy
½-in. and smaller ...	25	
⅝-in. & ⅝-in.	23	
¾-in.-1½-in.	23	
1⅝ in. and larger	16	
H.P. Hex.:		
½-in. & smaller	33	29
⅝-in. & ⅝-in..	28	25
¾-in.-1½-in. ..	25	23
1⅝ in. & larger	17	16
C.P. Hex:		
½-in. & smaller	33	29
⅝-in. & ⅝-in..	30	27
¾-in. & 1½ in.	27	24
1⅝ in. & larger	20	17

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or key quantities)

	Hvy.	Reg.	Lght.
½-in. and smaller ...	35	41	41
⅝-in. & ⅝-in.	30	36	36
¾-in.-1½ in..	27	31	33
1⅝-in.&larger	17	21	..

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish ..... 63.5 & 10
Plated finishes ... 50 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:
- ¼-in. through ⅝-in... 50
- ⅜-in. through 1 in... 43

Longer than 6 in.:
- ¼-in. through ⅝-in... 33
- ⅜-in. through 1 in... 13

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam x 6 in. and shorter 46
1 in. and smaller diam. x over 6 in. 33

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller 41
¼-in. diam. & larger ... 24
N.F. thread, all diams. . 18

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger 7.25c
⅞-in., under .....43 off

Washers, Wrought

F.o.b. shipping point, to jobbers .....Net to $1 off

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Cents per lb
17,18,20	60,72	16.00
8 to 16	48,60,72	16.50
7	48,60	17.75
6	48,60	19.00
4, 5⅛	40	19.50
3	40	20.50
2½	24,30	21.00
2	24,30	23.00

CARBON

40	100,110	7.50
35	100,110	7.50
30	84,110	7.50
24	72 to 104	7.50
17 to 20	34,90	7.50
14	60,72	8.00
10,12	60	8.25

STAINLESS STEEL

(cents per pound)

Type	Sheets (cents per pound)	C.R. Strip (cents per pound)	Bars Wire Structurals (cents per pound)
301...	37.50	30.50	28.50
302...	37.50	33.00	28.50
...	38.50	36.50	31.00
304...	39.50	35.00	30.00
309...	52.00	52.00	41.50
316...	53.00	55.00	46.00
321...	45.50	44.50	34.00
347...	50.00	48.50	38.50
410...	33.00	27.00	23.00
416...	33.50	33.50	23.50
420...	40.50	43.50	28.50
430...	35.50	27.50	23.50
501...	24.00	22.50	11.50
502...	25.00	23.50	12.50

Baltimore, Types 301 through 347 sheets, except 309 E2.

Baltimore, bars, wire and structurals A10.

Brackenridge, Pa., sheets A4

Bridgeville, Pa., bars, wire, sheets & strip, except Type 309 strip quoted 51.00c U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502 A10.

Carnegie, Pa., strip except Type 416; Type 309 strip quoted 51.00c S18.

Cleveland, strip, except Type 309 quoted 51.00c and except Type 416 A7.

Detroit, strip, except Type 309 M1.

Dunkirk, N.Y. bars, wire A4.

Duquesne, Pa., bars C3.

Gary, Ind., sheets except Type 416 C3.

Harrison, N. J., strip C18.

Massillon, all products, except Type 309 bars, wire & structurals quoted 42.00c. Type 501, 10.50c, Type 502 11.50c R2.

McKeesport, Pa., bars; sheets except Type 416, C3.

McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2.

Middletown, O., sheets and strip, except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars C3.

Pittsburgh, sheets C18.

Reading, Pa., bars & strip except Type 309 bars quoted 41.00c C4.

So. Chicago, Ind., bars & structurals C3.

Syracuse, N. Y., bars wire & structurals C18.

Titusville, Pa., bars U4.

Wallingford, Conn., strip, except 309, W2 quotes ¼-cent higher.

Washington, Pa., bars sheets & strip except Type 309 strip quoted 51.00c J3.

Washington, Pa., Types 301 through 347 sheets & strip as listed except 303 & 309; 316 sheets 58.00c, strip 60.00c W4.

Watervliet, N. Y., structurals & bars A4.

Waukegan, bars & wire A7

West Leechburg, Pa., strip, except Type 300 quoted 51.00c A4.

Youngstown, strip C8.

COAL, CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 22.00
Toluol, one deg. .19.00-24.75
Industrial xylol. .20.50-26.50

Per ton bulk, ovens

Sulphate of ammonia .$45.00

Cents per pound, ovens

Phenol, 40 (carlots, returnable drums) 13.50
Do., less than carlots .14.25
Do., tank cars 12.50

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.

Imported, net ton, duty paid, metallurgical grade, $39-$40.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh)

	Cents
Sponge Iron:	
98+% Fe, carlots..	15.00
Swedish, c.l.f. New York, in bags..	7.40-8.50
Electrolytic Iron:	
Annealed, 99.5% Fe	39.50
Unannealed, 99+% Fe	33.50
Unannealed, 99+% Fe (minus 325 mesh)	48.50
Carbonyl Iron:	
97.9-99.8%, size 5 to 10 microns..	70.00-135.00
Aluminum:	
Carlots, freight allowed	27.00
Atomized, 500 lb drums, freight allowed	30.00
Brass, 10-ton lots.	23.25-26.25
Copper:	
Electrolytic	27.75
Reduced	27.00
Lead	18.50
Manganese:	
Minus 100-mesh	52.00-55.00
Minus 35 mesh	48.00
Minus 200 mesh....	56.00
Nickel, unannealed	61.00-66.00
Silicon	34.00-40.00
Solder (plus cost of metal)	8.50
Stainless Steel, 302...	75.00
Tin	86.50
Zinc, 10-ton lots..	15.25-18.00
	Dollars
Tungsten:	
99%, minus 80 to 200 mesh, freight allowed, over 1000 lb	2.90
1000 lb	2.95
less than 1000 lb..	3.00
98.8%, minus 65 mesh, freight allowed. 1000 lb and over..	2.90
less than 1000 lb..	3.00
Molybdenum:	
99%, minus 80 to 200 mesh, over 500 lb	2.25
200 to 500 lb	2.60
less than 200 lb...	2.75
82-88%, freight allowed, 2000 lb and over..	2.40
less than 2000 lb..	2.45
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvll, fur.	$14.00-14.50
Connellsvll, fdry.	15.50-16.50
New River, foundry	19.00
Wise county, foundry	15.95
Wise county, furnace..	15.20

OVEN FOUNDRY COKE

Kearney, N. J., ovens	$22.00
Everett, Mass., ovens	
New England, del.‡	*23.40*
Chicago, ovens	21.00
Chicago, del.	†22.45
Detroit, del.	24.91
Terre Haute, ovens	21.20
Milwaukee, ovens	21.75
Indianapolis, ovens	20.75
Chicago, del.	24.12
Cincinnati, del.	23.67
Detroit, del.	24.65
Ironton, O., ovens	20.40
Cincinnati, del.	22.71
Painsville, O., ovens	21.90
Buffalo, del.	24.02
Cleveland, del.	23.62
Erie, del.	22.04
Birmingham, ovens	18.70
Philadelphia, ovens	*21.25*
Neville Island, Pa., ovens	*21.00*
Swedeland, Pa., ovens	*21.20*
Portsmouth, O., ovens	19.50
Detroit, ovens	21.65
Detroit, del.	22.65
Buffalo, del.	24.00
Flint, del.	24.09
Pontiac, del.	23.04
Saginaw, del.	24.40

Includes representative switching charge of: *, $1.05; †, $1.45, one-track charge being $1.20, two tracks $1.40, and three or more tracks $1.50. ‡ Or within $4.15 freight zone from works.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York (city)	5.75	6.84	7.20	6.04	...	5.85	6.64	8.60	5.65	5.90	7.34
New York(c'try)	5.55	6.64	7.00	5.84	...	5.65	6.44	8.40	5.45	5.70	7.14
Boston (city) ..	5.93	6.68	7.19	5.98	...	5.80	6.50	8.70	5.75	6.08	7.28
Boston (c'try) .	5.73	6.48	6.99	5.78	...	5.60	6.30	8.50	5.55	5.88	7.08
Phila. (city) ..	6.45	6.60	6.95	5.90	...	5.75	6.46	8.40	5.50	5.70	6.80
Phila. (c'try)..	6.20	6.35	6.70	5.65	...	5.50	6.21	8.15	5.25	5.45	6.55
Balt. (city) ...	5.25	6.69	6.66	5.79	...	5.69	6.39	...	5.69	5.40	7.04
Balt. (c'try) ..	5.05	6.49	6.46	5.59	...	5.49	6.19	...	5.49	5.20	6.84
Norfolk, Va. ..	6.10	...	...	...	...	6.15	7.20	...	6.20	6.15	7.55
Wash. (w'hse).	5.46	...	...	6.00	...	5.90	6.62	...	5.90	5.61	7.25
Buffalo (del.)..	5.25	6.00	7.00	5.61	...	5.25	5.95	10.10††[5]	5.35	5.65	6.95
Buffalo (w'hse)	5.05	5.80	6.80	5.41	...	5.05	5.75	9.90††[5]	5.15	5.45	6.75
Pitts. (w'hse)..	5.05	5.80*	6.45-6.70	5.20	6.15	5.00	5.75	9.55††	5.05	5.15	6.40
Detroit (w'hse).	5.33	6.08*	7.09	5.49	...	5.39	6.03	9.86††[5]	5.44	5.59	6.68
Cleveland (del.)	5.25	6.00	7.15	5.44	6.35	5.32	5.95	8.31	5.37	5.52	6.72
Cleve. (w'hse).	5.05	5.80	6.95	5.24	6.15	5.12	5.75	8.16	5.17	5.32	6.52
Cincin. (w'hse).	5.32	5.84	6.29	5.49	...	5.39	6.10	9.90††[5]	5.44	5.59	6.75
Chicago (city) .	5.25	6.00*	6.90	5.30	...	5.20	5.85	9.75††[5]	5.25	5.40	6.60
Chicago (w'hse)	5.05	5.80*	6.70	5.10	...	5.00	5.65	9.55††[5]	5.05	5.20	6.40
Milwaukee(city)	5.39	6.14*	7.04	5.44	...	5.34	6.09	9.89††[5]	5.39	5.54	6.74
Milwau. (c'try).	5.19	5.94*	6.84	5.24	...	5.14	5.89	9.69††[5]	5.19	5.34	6.54
St. Louis (del.).	5.78	6.28	7.18	5.58	...	5.48	6.28	10.03††[5]	5.53	5.68	6.88
St. L. (w'hse).	5.58	6.13	7.03	5.43	...	5.33	6.08	9.88††[5]	5.38	5.53	6.73
Birm'ham (del.)	5.20[10]	5.95	6.30[2]	5.25[10]	...	5.15[10]	6.88	...	5.20[10]	5.35[10]	7.63[10]
Birm'hm(w'hse)	5.05[10]	5.80	6.15[2]	5.10[10]	...	5.00[10]	...	...	5.05[10]	5.20[10]	...
Omaha, Nebr. .	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Los Ang. (city)	5.95	7.15	7.60	6.00	8.25	5.95	7.70	...	5.85	5.95	8.15
L. A. (w'hse).	5.80	7.00	7.45	5.85	8.10	5.80	7.55	...	5.70	5.80	8.00
San Francisco .	6.25[9]	8.60[2]	7.50[2]	6.75[9]	8.25[3]	6.15[9]	7.80[3]	...	6.00[9]	6.15[9]	8.10[9]
Seattle-Tacoma.	6.70[7]‡	8.15[3]	...	6.90	...	6.35	8.50	10.10	6.20	6.35[7]	8.40[7]
Kans. (w'hse) .	5.65	6.40	7.30	5.70	...	5.60	6.35	10.10	5.65	5.80	7.00

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [1]—1500 lb and over; [2]—500 to 1499 lb; [3]—450 to 1499 lb; [4]—400 to 1499 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—300 to 999 lb; [8]—300 to 499 lb; [9]—400 to 3999 lb; [10]—500 to 9999 lb inclusive.

REFRACTORIES

(Prices per 1000 bricks, f.o.b. plant)

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., $107; Ottawa, Ill., $106. Hard-fired, $141 at above points.

High-Heat Duty: Salina, Pa. $91; Woodbridge N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $86.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $80.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., $72; Ottawa, Ill., $70.

LADLE BRICK

Dry Press: Freeport, Merill Station, Clearfield, Pa., Irondale, Wellsville, O., Chester, W. Va., New Cumberland, W. Va., $60.

Wire Cut: Chester, W. Va., Wellsville, O., New Cumberland, W. Va., $58.

MALLEABLE BUNG BRICK

St. Louis, Mo., Olive Hill, Ky., $96; Ottawa, Ill., $90; Beach Creek, Pa., $86.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Portsmouth, O., Ensley, Ala., $86; Hays, Pa., $91; Joliet or Rockdale, Ill., E. Chicago, Ind., $95; Lehi, Utah, Los Angeles, $101.

Eastern Silica Coke Oven Shapes (net ton): Claysburg, Mt. Union, Sproul, Pa., Birmingham, $84.

Illinois Silica Coke Oven Shapes (net ton): Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $85.

BASIC BRICK

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Burned chrome brick, $66; chemical-bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

MAGNESITE

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead-burned, ⅜" grains; bulk, $30.50-$31; single paper bags, $35-$35.50.

DOLOMITE

(Base prices per net ton)

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

ORES

LAKE SUPERIOR IRON ORE

Gross ton, 51½% (natural), lower lake ports. After Jan. 25, 1950, increases or decreases, if any, in upper lake rail freight, dock handling charges and taxes thereon are for buyer's account.

Old range bessemer	$8.10
Old range nonbessemer	7.95
Mesabi bessemer	7.85
Mesabi nonbessemer	7.70
High phosphorus	7.70

EASTERN LOCAL ORE

Cents per unit, del E. Pa.

Foundry and basic 56.62% concentrates contract	16.00

FOREIGN ORE

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hemitites	15.75
Brazilian iron ore, 68-69%	18.00

TUNGSTEN ORE

Wolframite, scheelite, net ton unit, duty paid	$20-$22

MANGANESE ORE

Long term contracts, nominal; nearby, 48%, duty paid, 79.8c-81.8c per long ton unit, c.i.f. U. S. ports; prices on lower grades adjusted to manganese content and impurities.

CHROME ORE

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00

South African Transvaal

44% no ratio	$17.00-18.00
45% no ratio	17.00-18.00
48% no ratio	26.00-27.00
50% no ratio	27.00-27.50

Brazilian

44% 2.5:1 lump	$32.00

Rhodesian

45% no ratio	$20.00-21.00
48% no ratio	25.00
48% 3:1 lump	35.00-36.00

Domestic—rail nearest seller

48% 3:1	$39.00

MOLYBDENUM

Sulphide concentrates per lb, molybdenum content, mines	$0.90

FERROALLOYS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, cl., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal, 2" x D (Mn 96% min., Fe 2% max., Si 1% max., C 0.2% max.): Carload lump bulk, 29c per lb of metal; packed, 35.5c; ton lot 31.25c, less ton lot 33.25c. Delivered. Spot, add 2c.

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered: Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

(*Please turn to page* 133)

Seeks Higher Tariff

Reynolds proposes boost in duties on aluminum as protections against Canadian imports

Washington—Reynolds Metals Co. seeks relief from the "low" aluminum tariff. In an application filed Mar. 24 with the United States Tariff Commission, the company asked the commission to recommend to the President an increase in duty on primary aluminum from 2 cents to 4.50 cents a pound and from 3 cents to 7 cents on semifabricated aluminum.

The company also recommended that the commission conduct a full investigation of the industry to determine the need for higher tariffs; and establish equitable import controls, geared to flexibility to United States needs, to "prevent further manipulation of the United States market by the Canadian producer."

The company said in part that since the 50 per cent tariff cut two years ago, ingot imports have jumped to five times the 1947 volume and sheet imports have rocketed from 100,000 pounds in 1947 to 15,800,000 pounds in 1949. The bulk of the imports come from the Aluminum Co. of Canada, described by Reynolds as the world's largest as well as the lowest-cost producer.

"Since end of the war, the position of the Canadian producer has been further strengthened with United States government funds," the Reynolds' statement continued. "Over $56 million of ECA funds have been used to buy Canadium aluminum. Only $543,000 was spent to buy U. S. aluminum. . . . . .

"The Canadian currency devaluation of last September accentuates the Aluminum Co. of Canada's advantages over United States producers. Since the 10 per cent devaluation, the Canadian company is realizing 1.4 cents per pound more profit on its United States sales. This is equivalnet to a 70 per cent cut of the present 2-cent tariff."

The company claims United States producers operate under these handicaps: Electric power costs are 209 per cent higher than in Canada; wages paid are 75.8 per cent higher and productivity is at least as high in Canada as in the United States; transportation costs of the dispersed United States industry are higher than those of the concentrated Canadian industry.

Copper Supplies Tighten

New York—Primary copper prices are holding unchanged despite an increasingly serious threat of a shortage of the metal.

Anaconda Copper Mining Co. has closed down casting furnaces at its Raritan, N. J., refinery for fear of a strike. Other facilities at the plant are in operation and shipments are being made from supplies of refined copper on hand. Negotiations in a wage dispute between the management and the workers at this plant have been in progress for several days. The Raritan copper refinery has been turning out about 15,000 tons of the refined metal each month.

Meanwhile, Anaconda's big copper mine at Chuquicamata, Chile, has been closed by a wildcat strike since mid-March. This property also had been producing copper at the rate of 15,000 tons monthly. If the Chilean strike is prolonged and negotiations at the Raritan copper refinery prove unsuccessful, it could mean the loss of 30,000 tons of copper production per month.

American copper mines and custom smelters produced 81,216 tons of metal in February, while copper shipments to domestic users totaled 112,773 tons. The difference between production and shipments of domestic copper is made up of imports of foreign metal, mostly from Chile.

Lead Curbs Eased in London

London—Due to the easier supply position of lead, metal traders here are predicting the Ministry of Supply will free that metal for trading on the London Metal Exchange, although this development is believed "some way off." It would be followed by freeing copper and zinc.

The lead allocation system was suspended at the end of March. Users are now able to obtain lead for consumption without any limit upon the amount to be procured for any given period. Even though there is no limit as to the amount a manufacturer may buy, he must continue to obtain licenses. Restrictions are also relaxed governing the supply of lead to be used in making sheet and pipe for export.

Silver Prices Drop ½-Cent

New York—Decline of 1½ cents in foreign silver on Mar. 29-30 was the first change in that market in nearly seven months. Handy & Harman is now quoting on the basis of 71.75c an ounce, New York.

The declines followed an offering by a foreign producer of a relatively small surplus quantity which was met with limited end-of-the-month demand from consuming interests. Contributing to the easier price tone has been the influx of foreign metal for sales here during the last several weeks. This silver has been sent here from Hong Kong, the Near East and from Europe.

No lots of additional foreign silver are believed to be overhanging the market. The silver market here has absorbed nearly 3 million ounces of the metal that has been shipped from Japan over the last few months.

Zinc Demand Heavy

Advance in price to 10.25c fails to dampen consumers' buying interest

New York—Demand for slab zinc continues strong, the ¼-cent advance on Mar. 27 having failed to dampen consumers' buying interest. Galvanizers, who had remained out of the market in February and early March, are taking large tonnages to cover nearby needs while other consumers are making commitments for stockpiling purposes.

The advance to 10.25c, East St. Louis, for prime western is the second increase since Mar. 14.

In addition to the active buying by galvanizers, another factor contributing to the market's strength is the reported purchase of about 30,000 tons of zinc for the government's permanent stockpile with delivery to be made in the second quarter. The government took 10,646 tons in February and 12,710 tons in January for this purpose compared with a monthly average of 7627 tons in 1949.

Aluminum Demand Gains

Pittsburgh — Aluminum Co. of America is studying the problem of increased imports, but has not publicly stated its position.

New orders for aluminum products in the first quarter exceeded those in the comparable period last year. Demand is expected to remain at high level at least through first half of 1950. Downtrend in new order volume developed last May, reaching a reduction of 50 per cent by July. Since that time, steady uptrend in new bookings has occurred.

Sellers report current output closely matches new order volume. This is reflected in part by the fact Alcoa is in position to make deliveries on all finished aluminum products within normal processing time.

World Tin Control Planned

New York—An international conference for the purpose of examining and adopting a scheme to regulate world tin production is planned. International Tin Study Group has agreed to ask the secretary general of the United Nations to convene the conference.

The Tin Study Group meetings, held in Paris, were attended by representatives of all the leading tin producing and consuming nations, including a large delegation from the United States.

Although details of proposals are not available, it is learned that the principle of establishing a "buffer stock" has been adopted. This policy is designed to prevent violent fluctuations in the market price of tin and would be similar to the prewar arrangements. Under the prewar buffer pool plan, tin was bought when the price was low and demand light; tin was sold when prices had advanced and demand improved.

In the domestic market, Straits tin prices have declined to around 76.50c from a high of 77.75c a week earlier.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 18.50c, Conn. Valley; Lake, 18.62½c, Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 16.75-18.25c; 88-10-2 (No. 215) 25.25c; 80-10-10 (No. 305) 21.75c; No. 1 yellow (No. 405) 14.25-16.00c.

Zinc: Prime western 10.25c, brass special 10.50c, intermediate 10.75c, East St. Louis; high grade 11.35c, delivered.

Lead: Common, 10.30c; chemical, 10.40c; corroding, 10.40c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point.

Secondary Aluminum: Piston alloys 16.00-16.50c; No. 12 foundry alloy (No. 2 grade) 15.50-16.00c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 17.25-17.75c; grade 2, 16.75-17.25c; grade 3, 15.25-15.75c; grade 4, 14.75-15.00c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt del., 76.50c; April del. 76.37½c; May del. 76.25c; June del. 76.12½c.

Antimony: American 99-99.8% and over but not meeting specifications below 24.50c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 25.00c; f.o.b. Laredo, Tex., for bulk shipments. Foreign, 99%: Chinese, English, Belgian, prompt, 23.00c, New York.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $71-$74 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $2 del.; special or patented shapes, $2.15.

Cobalt: 97-99%, $1.80 per lb for 550 lb (keg); $1.80 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 71.75c per oz.

Platinum: $66-$69 per ounce.

Palladium: $24 per troy ounce.

Iridium: $100 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill; based on 18.50-cent copper.)

Sheet: Copper 32.18; yellow brass 28.69; commercial bronze, 95%, 32.10; 90%, 31.61; red brass, 85%, 30.60; 80%, 30.12; best quality, 29.58; nickel silver, 18%, 42.27; phosphor-bronze, grade A, 5% 50.90.

Rods: Copper, hot-rolled 28.03; cold-drawn 29.28; yellow brass free cutting, 23.19; commercial bronze, 95% 31.79; 90% 31.30; red brass 85% 30.29; 80% 29.81.

Seamless Tubing: Copper 32.22; yellow brass 31.70; commercial bronze 90% 34.27; red brass 85% 33.51; 80% 33.03.

Wire: Yellow brass 28.98; commercial bronze, 95% 32.39; 90% 31.90; red brass, 85% 30.89; 80% 30.41; best quality brass 29.87.

Copper Wire: Bare soft, f.o.b., eastern mills, 100,000 lb lots 22.55c, l.c.l. 23.17, c.l. 22.67; weatherproof, f.o.b. eastern mills, 100,000 lb lots 24.85, l.c.l. 25.60, c.l. 25.10; magnet, delivered, c.l. 28.50, 15,000 lb or more 28.75, l.c.l. 29.25.

ALUMINUM

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-24	36.8	33.4	39.5
0.008-0.0075	12-24	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	R317-T4	—Hexagonal— 17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	...	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	36.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $15.50 per cwt; add 50c per cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, $15.50 per cwt. Traps and bends: List price plus 37%.

ZINC

Sheets, 16.00c f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 15.50c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 14.50c; over 12-in., 15.50c.

NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled, 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb, 35.00-36.00c.

DAILY PRICE RECORD

1950	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Mar. 30	18.50	10.30	10.25	76.50	17.00	24.50	40.00	71.75
Mar. 29	18.50	10.30	10.25	76.50	17.00	24.50	40.00	72.75
Mar. 28	18.50	10.30	10.25	76.50	17.00	24.50	40.00	73.25
Mar. 27	18.50	10.30	10.25	77.12½	17.00	24.50	40.00	73.25
Mar. 23-25	18.50	10.30	10.00	77.75	17.00	24.50	40.00	73.25
Mar. 22	18.50	10.30	10.00	77.50	17.00	24.50	40.00	73.25
Mar. 21	18.50	10.30	10.00	77.12½	17.00	24.50	40.00	73.25
Mar. 20	18.50	10.30	10.00	76.25	17.00	24.50	40.00	73.25
Mar. 17-18	18.50	10.30	10.00	76.00	17.00	24.50	40.00	73.25
Mar. 16	18.50	10.30	10.00	77.00	17.00	24.50	40.00	73.25
Mar. 15	18.50	10.30	10.00	76.50	17.00	24.50	40.00	73.25
Mar. 14	18.50	10.30	10.00	75.50	17.00	24.50	40.00	73.25
Mar. 13	18.50	10.80	9.75	74.75	17.00	24.50	40.00	73.25
Mar. 9-11	18.50	10.80	9.75	74.625	17.00	24.50	40.00	73.25
Mar. 6-8	18.50	11.80	9.75	74.625	17.00	24.50	40.00	73.25
Mar. 2-4	18.50	11.80	9.75	74.50	17.00	24.50	40.00	73.25

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 25.50c; 5 tons and over 26.00c; 1 to 5 tons, 26.50c; less than 1 ton, 27.00c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 28.84c; oval 28.34c; cast 26.87c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 46.50c f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,000 lb, 17.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 25.75c; over 250 lb, 24.75c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 100 lb, 64.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 26.50c; 400-lb bbl. 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over 91.00c; 500 to 999 lb, 91.5c; 200 to 499 lb, 92.00c; less than 200 lb, 93.5c; ball, 1000 lb and over, 93.25c; 500 to 999 lb, 93.75c; 200 to 499 lb 94.25c; less than 200 lb, 95.75c f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 58.2c; 100 or 300 lb drums only, 100 to 500 lb, 49.9c; 600 to 1900 lb, 47.6c; 2000 to 9900 lb, 45.8c, f.o.b. Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100-lb drums 38.00c, f.o.b. Niagara Falls, N. Y.; 40.50c f.o.b. Cleveland; 39.25c, del., Detroit and Philadelphia.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb 84.50c; more than 2000 lb, 82.50c, f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, 70.80c; 100 lb kegs 71.80c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb, f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	15.50	15.50	14.75
Yellow Brass	12.50	12.25	11.37½
Commercial Bronze			
95%	14.50	14.25	13.75
90%	14.25	14.00	13.50
Red brass			
85%	14.00	13.75	13.25
80%	13.62½	13.37½	12.87½
Best Quality (71-80%)	13.37½	13.12½	12.62½
Muntz Metal	11.50	11.25	10.75
Nickel, silver, 10%	14.50	14.25	7.25
Phos. bronze, A	16.75	16.50	15.50
Naval brass	12.00	11.75	11.25
Manganese bronze	12.00	11.75	11.12½

BRASS INGOT MAKERS' BUYING PRICES

(Cents per pound, delivered eastern refineries, carload lots)

No. 1 copper 15.25; No. 2 copper 14.25; light copper 13.25; composition red brass 12.50; radiators 10.00; heavy yellow brass 9.50.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 15.25; No. 2 copper 14.25; light copper 13.25; refinery brass (60% copper) per dry copper content 13.50-13.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 13.50-13.75; No. 2 12.50-12.75; light copper 11.50-11.75; No. 1 composition red brass 11.00-11.25; No. 1 composition turnings 10.25-10.50; mixed brass turnings 6.25-6.50; new brass clippings 10.50-11.00; No. 1 brass rod turnings 9.25-9.50; light brass 6.00-6.25; heavy yellow brass 7.25-7.50; new brass rod ends 9.75-10.00; auto radiators, unsweated 8.50-8.75; cocks and faucets, 8.50-8.75; brass pipe 9.00-9.25.

Lead: Heavy 8.00-8.25; battery plates 3.50-3.75; linotype and stereotype 8.75-9.00; electrotype 8.25-8.50; mixed babbitt 8.00-8.25.

Zinc: Old zinc 4.75-5.00; new die cast scrap 4.50-4.75; old die cast scrap 3.25-3.50.

Tin: No. 1 pewter 39.00-41.00; block tin pipe 60.00-62.00; No. 1 babbitt 30.00-32.00.

Aluminum: Clippings 2S 10.00-10.50; old sheets 7.00-7.50; crankcase 7.00-7.50; borings and turnings 4.00.

IRON AND STEEL SCRAP

Consumer prices, except as otherwise noted, including brokers' commissions, as reported to STEEL, Mar. 30, 1950; gross tons except as noted. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Mar. 30	$28.75
Mar. 23	28.66
Feb. 1950	27.52
Mar. 1949	34.60
Mar. 1945	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 Heavy Melt.	$32.00
No. 2 Heavy Melt.	29.00
No. 1 Busheling	32.00
No. 1 Bundles	32.00
No. 2 Bundles	*24.50-25.50*
No. 3 Bundles	23.00-24.00*
Heavy Turnings	*27.50-28.00*
Machine Shop Turnings	*22.50-23.00†*
Mixed Borings, Turnings	*22.50-23.00†*
Short Shovel Turnings	*26.00*
Cast Iron Borings	*25.00-26.00*
Low Phos. Steel	34.50-36.00

Cast Iron Grades*

No. 1 Cupola Cast	34.00-35.00
No. 1 Machinery Cast	38.00-39.00
Charging Box Cast	31.00-32.00
Heavy Breakable Cast	29.00-30.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	33.00-33.50
Axles	35.00-36.00
Rails, Random Lengths	35.50-36.00
Rails, 2 ft. and under	39.00-40.00
Rails, 18 in. and under	40.00-41.00
Railroad Specialties	35.50-36.00
Angles, Splice Bars	37.00-38.00*

* Nominal.
† Crushers' buying prices.

CLEVELAND

No. 1 Heavy Melt. Steel	*$29.00-29.50*
No. 2 Heavy Melt. Steel	*27.00-27.50*
No. 1 Busheling	*29.00-29.50*
No. 1 Bundles	*29.00-29.50*
No. 2 Bundles	*23.00-23.50*
Machine Shop Turnings	*19.00-19.50*
Mixed Borings, Turnings	*22.00-22.50*
Short Shovel Turnings	*22.00-22.50*
Cast Iron Borings	*22.00-22.50*
Low Phos.	*30.00-30.50*

Cast Iron Grades

No. 1 Cupola	42.00-43.00
Charging Box Cast	38.00-39.00
Stove Plate	35.50-36.50
Heavy Breakable Cast	32.00-32.50
Unstripped Motor Blocks	31.00-32.00
Brake Shoes	28.50-29.50
Clean Auto Cast	42.50-43.50
No. 1 Wheels	36.50-37.00
Burnt Cast	33.00-33.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.50-33.00
R.R. Malleable	38.50-39.00
Rails, 3 ft and under	41.00-42.00
Rails, 18 in. and under	43.00-44.00
Rails, Random Lengths	38.00-39.00
Cast Steel	34.00-35.00
Railroad Specialties	35.00-35.50
Uncut Tires	36.00-37.00
Angles, Splice Bars	41.00-41.50

VALLEY

No. 1 Heavy Melt. Steel	*$32.50-33.00*
No. 2 Heavy Melt. Steel	*30.00-31.00*
No. 1 Bundles	*32.50-33.00*
No. 2 Bundles	*25.50-26.50*
Machine Shop Turnings	*22.00-23.00*
Short Shovel Turnings	*24.50-25.00*
Cast Iron Borings	*24.50-25.00*
Low Phos.	*33.50-34.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	33.00-33.50

PHILADELPHIA

No. 1 Heavy Melt. Steel	*$25.00-25.50*
No. 2 Heavy Melt. Steel	*23.00-23.50*
No. 1 Busheling	*23.00-23.50*
No. 1 Bundles	*25.00-25.50*
No. 2 Bundles	19.50-20.00
Machine Shop Turnings	18.00
Short Shovel Turnings	19.50
Mixed Borings, Turnings	17.00
Low Phos. Punchings and Plate, elec. fur. grade	*29.00-30.00*
Low Phos. Plate, 5 ft & under	*29.00*
Elec. Furnace Bundles	26.50
Heavy Turnings	*25.00-25.50*
No. 1 Chemical Borings	29.00
Knuckles and couplers	30.00
Steel car wheels	30.00

Cast Iron Grades

No. 1 Cupola Cast	*32.00-33.00*
No. 1 Machinery Cast	*37.00*
No. 1 Yard Cast	30.00
Charging Box Cast	*35.00*
Heavy Breakable Cast	*35.00*
Unstripped Motor Blocks	25.00
Clean Auto Cast	*37.00*
No. 1 Wheels	*39.00*
Malleable	39.00-40.00

CINCINNATI

No. 1 Heavy Melt. Steel	$27.00
No. 2 Heavy Melt. Steel	23.00
No. 1 Busheling	27.00
No. 1 Bundles	27.00
No. 2 Black Bundles	23.00
No. 3 Bundles	18.00
Machine Shop Turnings	14.00
Short Shovel Turnings	17.00
Mixed Borings, Turnings	16.00
Cast Iron Borings	17.00

Cast Iron Grades

No. 1 Cupola Cast	38.00
Charging Box Cast	36.00
Stove Plate	28.00
Heavy Breakable Cast	32.00
Unstripped Motor Blocks	22.00
Brake Shoes	22.00
Clean Auto Cast	38.00
Drop Broken Cast	42.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	30.00
R.R. Malleable	33.00
Rails, Rerolling	34.00
Rails, Random Lengths	33.00
Rails, 18 in. and under	42.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	*$23.00-23.50*
No. 1 Bundles	*27.00-27.50*
No. 2 Bundles	20.00-21.00
No. 1 Busheling	*26.00-26.50*
Machine Shop Turnings	*16.50-17.00*
Mixed Borings, Turnings	*16.50-17.00*
Short Shovel Turnings	*19.00-19.50*
Cast Iron Borings	*19.00-19.50*
Punchings & Plate Scrap	*27.00-27.50*

Cast Iron Grades

No. 1 Cupola Cast	33.00-34.00
Heavy Breakable Cast	29.00-30.00
Clean Auto Cast	*39.00-40.00*

BUFFALO

No. 1 Heavy Melt. Steel	$28.00-28.50
No. 2 Heavy Melt. Steel	25.50-26.00
No. 1 Bushelings	25.50-26.00
No. 1 Bundles	26.50-27.00
No. 2 Bundles	24.00-24.50
Machine Shop Turnings	18.00-18.50
Mixed Borings, Turnings	19.00-19.50
Cast Iron Borings	19.00-19.50
Short Shovelings	19.50-20.00
Low Phos.	29.00-29.50

Cast Iron Grades

No. 1 Machinery	*36.50-37.00*
No. 1 Cupola	*32.50-33.50*
Stove Plate	*31.50-32.50*
Malleable	*32.50-33.00*

Railroad Scrap

Rails, 2 ft. and under	38.00-39.00
Scrap rails	35.00-35.50
Specialties	33.00-34.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$21.50-22.00
No. 2 Heavy Melt. Steel	18.00-18.50
No. 1 Busheling	18.00-18.50
No. 1 Bundles	21.50-22.00
No. 2 Bundles	16.00-16.50
Machine Shop Turnings	*12.00-12.50*
Mixed Borings, Turnings	*12.00-12.50*
Short Shovel Turnings	*13.50-14.00*
Punchings & Plate Scrap	*23.50-24.00*
Low Phos. Plate, 5 ft & under	*23.50-24.00*
Elec. Furnace Bundles	21.50-22.00

Cast Iron Grades

No. 1 Cupola Cast	26.00-26.50
No. 1 Machinery	*27.00-28.00*
Charging Box Cast	*26.00-27.00*
Heavy Breakable	*26.00-27.00*
Unstripped Motor Blocks	20.00
Malleable	34.00

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	$20.00-20.50
No. 2 Heavy Melt. Steel	17.00-17.50
No. 1 Bundles	19.00-20.00
No. 1 Busheling	19.00-19.50
Machine Shop Turnings	11.00-11.50
Mixed Borings, Turnings	10.50-11.00
Short Shovel Turnings	13.00-13.50
Bar Crops and Plate	21.00-22.00
Punchings & Plate Scrap	21.00-22.00
Chemical Borings	19.00-19.50

Cast Iron Grades

No. 1 Cupola Cast	27.50-30.50
Mixed Cast	21.00-22.00
Heavy Breakable Cast	24.50-25.50
Stove Plate	21.50-22.50
Unstripped Motor Blocks	17.50-18.50

CHICAGO

No. 1 Heavy Melt. Steel	$29.00
No. 2 Heavy Melt. Steel	27.00
No. 1 Bundles	*28.00**
No. 2 Bundles	25.00
Machine Shop Turnings	*18.00-19.00*
Mixed Borings, Turnings	*20.50-21.00*
Short Shovel Turnings	*21.00*
Cast Iron Borings	*20.00-21.00*
Low Phos.	30.50-31.50
Elec. Furnace Bundles	*29.00-30.00*
Heavy Turnings	23.00-24.00
Cut Structurals	30.00-30.50

Cast Iron Grades

No. 1 Cupola Cast	*42.00-43.00*
Clean Auto Cast	*42.00-43.00*
No. 1 Wheels	36.00-37.00
Stove Plate	*32.00-33.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	30.00-30.50
Malleable	*42.00-43.00*
Rails, Rerolling	45.00-46.00
Rails, Random Lengths	35.00-36.00
Rails, 2 ft and under	41.00-42.00
Rails, 18 in. and under	42.00-43.00
Railroad Specialties	32.00-33.00
Angles, Splice Bars	*38.00-39.00*

* Mar. 27 price also was $28.

BIRMINGHAM

No. 1 Heavy Melt. Steel	$24.00
No. 2 Heavy Melt. Steel	22.00
No. 1 Busheling	22.00
No. 2 Bundles	20.00
Machine Shop Turnings	19.50
Mixed Borings, Turnings	17.00
Short Shovel Turnings	23.00
Cast Iron Borings	19.00
Bar Crops and Plate	27.00-28.00
Cut Structurals	27.00-28.00

Cast Iron Grades

No. 1 Cupola Cast	35.00
Stove Plate	30.00
No. 1 Wheels	30.50-31.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	25.00-26.00
R.R. Malleable	nominal
Rails, Rerolling	33.00-35.00
Rails, 3 ft and under	nominal
Angles and Splice Bars	nominal

ST. LOUIS

No. 1 Heavy Melt. Steel	*$28.50-29.50*
No. 2 Heavy Melt. Steel	*24.50-25.50*
Machine Shop Turnings	14.00-15.00
Short Shovel Turnings	18.00-19.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00
Charging Box Cast	32.00-33.00
Heavy Breakable Cast	*30.00-31.00*
Brake Shoes	*28.00-29.00*
Clean Auto Cast	36.00-38.00
Burnt Cast	29.00-30.00

Railroad Scrap

R.R. Malleable	*33.00-34.00*
Rails, Rerolling	*42.00-44.00*
Rails, Random Lengths	*31.00-32.00*
Rails, 3 ft and under	37.00
Uncut Tires	*28.00-29.00*
Angles, Splice Bars	*35.00-36.00*
Railroad Specialties	*31.00-32.00*

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles	16.00
No. 3 Bundles	13.00
Machine Shop Turnings	9.00

Cast Iron Grades

No. 1 Cupola Cast	30.00-35.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Rails, Random Lengths	20.00

SEATTLE

No. 1 Heavy Melt. Steel	$18.00
No. 2 Heavy Melt. Steel	18.00
No. 1 Busheling	15.50
Nos. 1 & 2 Bundles	16.00
No. 3 Bundles	nom.
Machine Shop Turnings	13.00
Mixed Borings, Turnings	13.00
Punchings & Plate Scrap	27.50
Cut Structurals	27.50

Cast Iron Grades

No. 1 Cupola Cast	*30.00*
Heavy Breakable Cast	25.00
Stove Plate	25.00
Unstripped Motor Blocks	18.00
Malleable	25.00
Brake Shoes	20.00
Clean Auto Cast	27.50
No. 1 Wheels	27.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	19.00
Railroad Malleable	25.00
Rails, Random Lengths	19.00
Angles and Splice Bars	19.00

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles	16.00
No. 3 Bundles	nom.
Machine Shop Turnings	*5.00*
Mixed Borings, Turnings	*5.00*
Punchings & Plate Scrap	26.00

Cast Iron Grades

No. 1 Cupola Cast	*31.00-34.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Rails, Rerolling	32.00

HAMILTON, ONT.

(Delivered prices)

Heavy Melt.	$24.00
No. 1 Bundles	*24.00*
Mechanical Bundles	22.00
Mixed Steel Scrap	20.00
Mixed Borings, Turnings	18.00
Rails, Remelting	24.00
Rails, Rerolling	27.00
Busheling	*18.50*
Bushelings new factory, prep'd	22.00
Bushelings new factory, unprep'd	17.00
Short Steel Turnings	18.00

Cast Iron Grades

Cast	40.00-43.00*

* F.o.b. shipping point.

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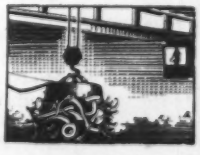

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BOSTON, MASS. Statler Bldg.	CLEVELAND, O. 1022 Midland Bldg.	LEBANON, PA. Luria Bldg.	PUEBLO, COLO. 334 Colorado Bldg.
BUFFALO, N.Y. Genesee Bldg.	DETROIT, MICH. 2011 Book Bldg.	NEW YORK, N.Y. Woolworth Bldg.	READING, PA. Luria Bldg.
ST. LOUIS, MO. 2110 Railway Exchange Bldg.		SAN FRANCISCO, CAL. Pacific Gas & Elec. Co., Bldg.	

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Sheets Strip . . .

Sheet and Strip Prices, Page 157 & 158

Cleveland—Business in light, flat-rolled steel was never better. Producers, booked heavily ahead, are turning down new business. Consumers are pressing to get on third quarter books but sellers are not accepting tonnage for that period. Republic Steel Corp. says tonnage carryover into third quarter promises to extend through July. This means third quarter actually will be a 2-month tonnage period from the standpoint of new orders. To what extent summer mill vacations, usually in July, will intensify the acute supply conditions remains to be determined. The mills have not yet decided whether to stagger vacations or close down entirely for a stated period. In any case, it is certain demand for flat-rolled will top production well through summer with mill quotas continuing in effect.

New York — Despite continued heavy demand, few sales of imported sheets are noted. Consumers find it difficult to place new orders with domestic mills. A number of the latter have withdrawn from the market on all major grades rather than open books for third quarter. Some mills have enough tonnage to run them through September. In certain specialties, particularly stainless strip, certain interests are accepting third quarter tonnage.

Boston—Pressure for deliveries is unabated but new buying is less feverish. Allocations are maintained. April rollings are studded with carryovers. Shipments of hot-rolled sheets from one Buffalo district mill are lower. Orders for narrow cold strip are heavy. Some third quarter volume is being tentatively accepted.

Philadelphia—With many mills out of the market on the major grades, sheet buyers are in a tough spot on new specifications. Shipments against old orders are coming through with little disruption, but the overall situation is very tight. Conversion deals are more numerous. Significantly, Penn Ohio Steel Co., is resuming operations at Birdsboro, Pa., for production of ingot for conversion purposes, after having been closed down many months.

Pittsburgh — Nonintegrated cold-rolled strip production is restricted by mill allotments of hot rolled sheets and strip. This has made it possible for some nointegrated interests to accept conversion tonnage. No easing in pressure for prompt deliveries is expected until well into third quarter. In addition to continued record-breaking demand from automotive accounts, sellers frequently are asked by electrical appliance interests to ship more tonnage.

Chicago—For every consumer receiving enough sheets under allocations, probably 10 do not. For this reason the conversion market is bubbling, ingots selling at $70-$72 here. Many users are forced to curtail output, or cannot expand production to desired levels because they lack sheets. For the moment there are no indications production is finding its way into consumer inventory. Silicon sheets are growing scarce, though May tonnage is still available.

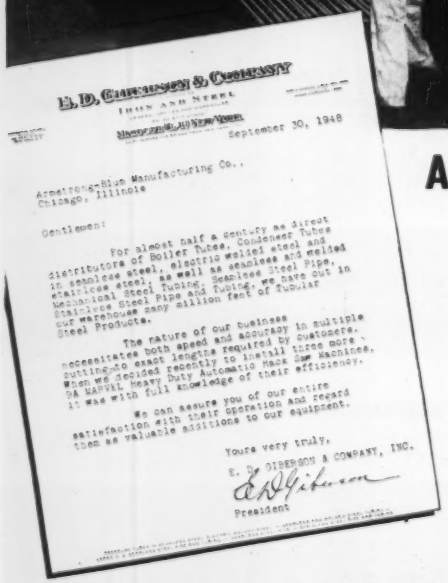
Cincinnati—Sheet mills will have heavy tonnage carryover into second quarter, due only partly to curtailments during the coal strike. Second quarter schedules are filled and inquiries indicate strong demand past the half-year mark. Steadily broadening field for stainless is noted.

Birmingham—Sheet shortage continues, stimulating talk of stricter allocations. Warehouse stocks of sheets are wholly inadequate to meet even the needs of those ordinarily depending on this source.

St. Louis—Sheet demand is strong. Supply is about 40 per cent below effective demand. To help satisfy requirements Granite City Steel Co. will install two coil annealing furnaces which will hike its cold-rolled sheet output 20 per cent by end of third quarter.

Los Angeles—Sheet consumers are scrambling for supplies. Deliveries from eastern sources have virtually stopped. A seasonal factor is heavy demand from highway sign manufacturers.

San Francisco—Pressure for flat-rolled products is increasing and supplies are scarce. Smaller tonnages are moving here from the East. Some eastern mills are reported to have halted westward shipments. In addition, can companies are building tin plate stocks for the coming food packing season and Columbia Steel Co. currently is rolling more tin plate and fewer sheets.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Iron and Steel
September 30, 1948

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The nature of our business necessitates both speed and accuracy in multiple cutting-to exact lengths required by customers. When we decided recently to install three more No. 9A MARVEL Heavy Duty Automatic Hack Saw machines, it was with full knowledge of their efficiency.

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Yours very truly,
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The local MARVEL Field Engineer will be glad to study your range of cutting-off work—whether it be in pipe, structural shapes, bars, or the toughest and largest alloy billets—and will then make recommendations on how you can improve your cutting-off operations to reduce costs and increase man-hour output.

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See our CATALOG in SWEET'S FILE

Steel Bars . . .

Bar Prices, Page 157

New York—Imports are exerting increasing effect in the local bar market, particularly on domestic mill sales to warehouses. This is due to foreign purchases by some distributors and to low-priced foreign competition inducing warehousemen to specify less freely from domestic producers.

Domestic mills' deliveries are well extended. Pittsburgh and Buffalo sellers normally active here offer little in small and medium sized bars before late second quarter. Seaboard producers of hot bars in some lines can ship in five weeks.

Most cold drawers have fair supplies of hot bars and offer cold-finished shipments in three to four weeks; even better where material is in stock. Alloy bar shipments are more extended.

Philadelphia—Hot carbon bar production is handicapped in the case of larger mills having diversified production by fact sufficient steel has not been allocated, because of diversion to products in greater demand, particularly light flat products. This is making for more extended deliveries, some sellers point out, than is justified by bar specifications.

Pittsburgh — Cold-finishers' schedules are retarded by inadequate supplies of hot bars. The unusually heavy demand for merchant bars, notably small sizes, has resulted in return to mill allotments for sizes under 3 in.

Cleveland—Merchant bar consumers are specifying actively. But delivery delays still are being encountered. Some finishing mills have not yet fully recovered from effects of the coal-strike curtailment. Mill billet stocks, in some cases, have not been sufficiently restored to sustain unbroken bar mill schedules. Substantial first quarter tonnage is being carried into second quarter. Third quarter deliveries will be proportionately delayed unless the mills are able to recoup lost tonnage between now and end of June. Strong demand for bars is coming from fastener makers and forge shops.

Plates . . .

Plate Prices, Page 157

Philadelphia—Backlogs of eastern plate mills show further gains. This is due to betterment in local demand, and pressure for tonnage from the Midwest and South. Certain eastern mills are turning down tonnage, particularly lighter gages, so as to have capacity available for regular customers.

Pipeline work in the Midwest and Southwest has been the major factor in building of plate backlogs. Eastern mills have felt the effects indirectly. Car requirements have picked up. The Lehigh Valley, closed on 1500 cars and the Reading is acting on a similar number. Repair programs are more active. Underground fuel oil and gas storage tank requirements are rising.

New York—Plate demand shows further slight gain. Specifications from tank shops and structural fabricators are improved and better volume is coming from railroad shops. District consumers have no difficulty in obtaining 3 to 4 weeks delivery from certain seaboard producers.

Birmingham—Mills are turning out plates at capacity rate and some stocks are being built up against the larger needs, such as carbuilding. The slack occasioned by the coal strike has not been taken up. The most acute shortage is reported in heavier gages.

San Francisco—Increasing supplies of foreign plates are coming into the local market at $5 to $10 per ton under domestic prices. One large fabricator recently bought 600 tons.

Seattle — Local plate fabricators have only fair backlogs, but awards to eastern plants have increased.

Tin Plate . . .

Tin Plate Prices, Page 158

Pittsburgh—Electrolytic tin plate demand continues in excess of output. This situation is not expected to improve in second and third quarters. Upturn in specifications for hot dipped is anticipated pending completion of electrolytic expansion programs. New lines are scheduled for Weirton Steel Co. and Wheeling Steel Corp., and a large Chicago area producer is considering similar expansion.

San Francisco—Good crop prospects and recent increase in canned food sales point to an active packing season. Can companies and packers are building tin plate stocks.

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Structural Shapes . . .

Structural Shape Prices, Page 157

New York — February structural bookings declined to 110,528 tons, reports American Institute of Steel Construction, compared with a revised total of 117,834 tons in January. Total for the first two months is about 12 per cent over the average for the period in prewar years, 1936-1940.

February shipments of 122,614 tons compared with a revised January figure of 133,430 tons. Tonnage available for fabrication in the next four months is 565,428, against 683,244 tons last year and 304,277 tons for the 1936-1940 average as of the end of February.

Boston—District fabricating shops are booking substantial bridge tonnage, generally on a price basis. Standard plain material deliveries are from three to four weeks. Outstanding commercial contract is for 800 tons for an insurance building, Manchester, N. H., to a Cambridge, Mass., shop. First of several contracts, arterial highway, Boston, is expected out soon. This will take 50,000 tons in all.

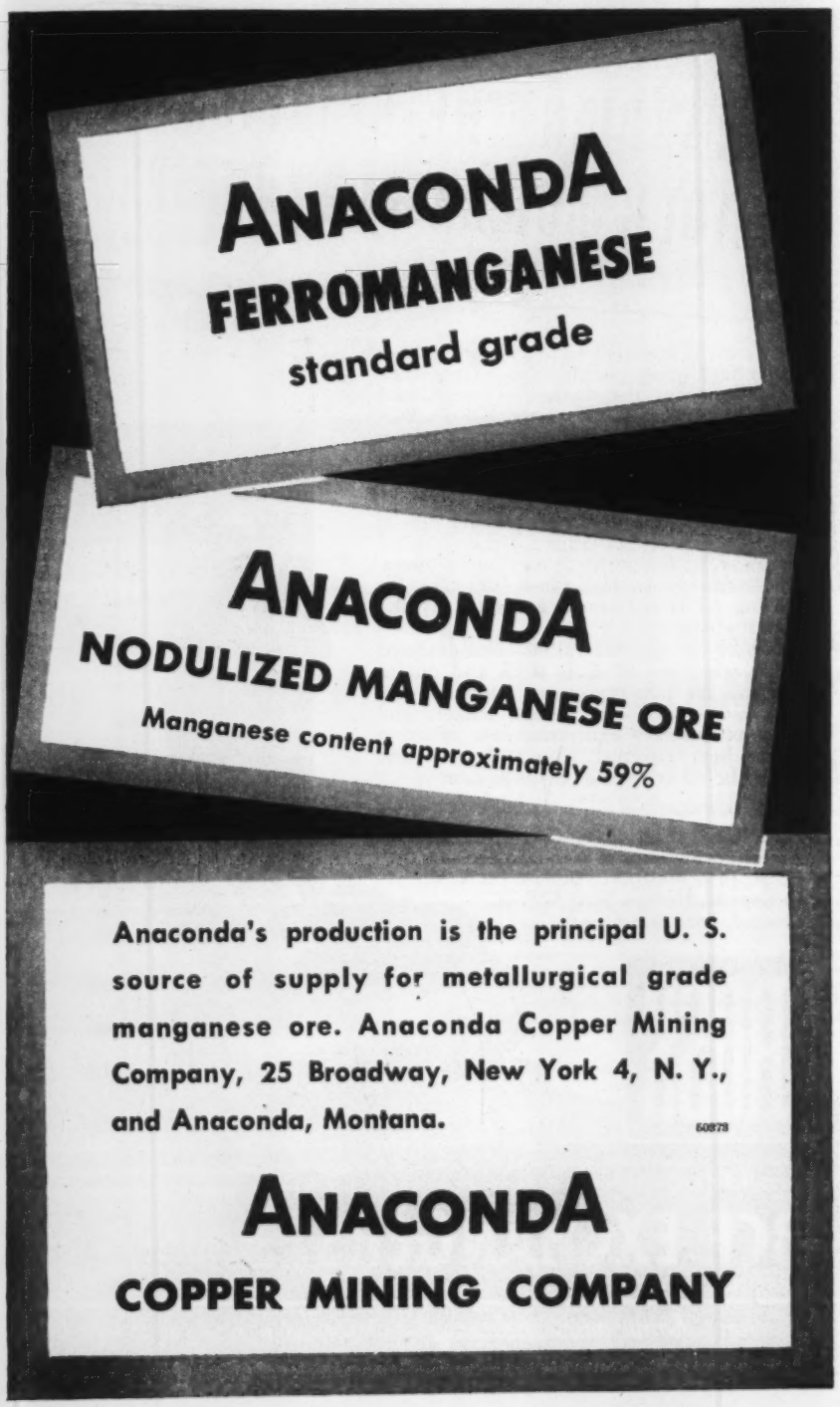
Philadelphia—Bridge work dominates the market. Bids closed on several sizable Pennsylvania state projects the past week, and others are being figured. Largest new program is the New Jersey turnpike, requiring more than 100,000 tons of fabricated bridgework. Bids on final sections should be in by August.

Cleveland—A large number of projects, most of them small, are shaping up for placement over coming months, but price shading on fabricated work injects a high degree of uncertainty in the market. Complicating the situation, competition from imported steel is seen as a serious threat to price stability, especially when lake shipping opens and it will be possible to deliver foreign steel at Great Lakes ports considerably under domestic levels.

Los Angeles—Demand is spotty but requirements have increased for 2-4 in. channels and for 1½, 2 and 3 in. angles. Upturn in demand stems from increased warehouse buying.

San Francisco—Demand for structurals is improving slowly. Buying is lower than hoped and supplies are readily available. Steel sash is in short supply.

Seattle—Sizable tonnages of shapes are pending. Fabricating plants have increased operations and within a month expect to be on a normal basis, following two slow months due to inclement weather.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Wire . . .

Wire Prices, Page 159

Boston—Wire allocations are unchanged for May. Some mills' capacity for specialties is taken for June and beyond but average delivery on low carbon wire ranges from six to eight weeks; somewhat better on coarser sizes. Demand for heading wire is steady. Tendency of screw manufacturers to buy finished wire rather than rods is gaining. Upholstery wire demand is off.

New York—Japanese nails of standard sizes are being offered in New York at $5.58, duty paid, per keg. This is almost $1 under eastern mill prices. Nails also are being imported from Belgium and Germany at concessions under the domestic market.

Pittsburgh—Merchant and manufacturers' wire items are booked 90 days or more ahead. Unusually heavy demand for low-carbon wire has developed for refrigerator racks, lamp shades, fan guards, etc.

Cleveland—Expanding demand for wire products is being encountered, especially from the farm trade. Automotive requirements are pressing and building needs heavy.

Chicago—Clamor for wire products is sufficient to fill order books on many products beyond June. Rod buyers must go outside the district to satisfy needs.

Fasteners . . .

Cleveland—Manufacturers of industrial fasteners are entertaining an increased volume of business. Automotive requirements are heavy, though absence of active demand from Chrysler suppliers is being felt in some directions. Farm equipment builders are taking larger tonnage. Probably the most recent encouraging development has been the return of railroads and carbuilders to the market for repair supplies. This type of business had almost vanished during the coal strike.

Tubular Goods . . .

Tubular Goods Prices, Page 160

Boston—Demand for merchant steel pipe is slow. Some distributors are not taking May quotas on butt-weld and seamless. Pipe fabricators orders are in better volume. Requirements for sprinkler systems are substantial.

Chicago—Bulging order backlogs for line pipe are full through 1951 in most cases. The "garden" variety of pipe is critically short with construction demand booming. Prompt delivery on hot-rolled tubing is quoted, with cold-drawn lagging considerably.

Los Angeles—Pipe demand is active. Emphasis currently is on water and gas transmission lines. Contracts were signed for a $5 million gas line, Palm Springs to Puente, Calif., and bids are asked on a 28-mile water line, Goleta to Carpenteria, to cost over $5 million.

Seattle—Cast iron pipe inquiry is slow. Buyers have ample stocks. No sizable jobs are up for bids.

Semifinished Steel . . .

Semifinished Prices, Page 157

Youngstown — With steelmaking operations in this district back to pre-coal strike level, local mills are working against a large volume of orders. Two bessemer plants, 70 open hearths and 21 blast furnaces are operating in the area.

Rails, Cars . . .

Track Material Prices, Page 159

Pittsburgh — Production schedules on rails, freight car wheels, axles and other railroad accessories should be well sustained most of second quarter. Order backlogs indicate a drop in operations in summer although freight car orders are well above first quarter, 1949. Independent carbuilders' order outlook for remainder of 1950 is uncertain.

Pig Iron . . .

Pig Iron Prices, Page 156

New York—District foundry melt shows improvement for first time in weeks. Daily shipments of iron in March did not show any appreciable pickup over immediately preceding months but betterment is expected this month. Pig iron production is gaining.

Boston—Foundry and malleable iron prices are held unchanged for second quarter by Mystic Iron Works. Gain in foundry activity is accompanied by mild increase in demand. Overall melt is estimated around 60 per cent of capacity. Builders of paper mill machinery have better backlogs.

Pittsburgh—Merchant foundry iron output is scheduled at theoretical capacity by the local producer through second quarter. Merchant iron is in relatively tight supply.

Buffalo—District blast furnace operations soared to 93½ per cent of capacity. Despite the jump in iron output the foundry situation remains spotty. Demand from heating equipment manufacturers is tapering.

Cleveland — Stronger demand for merchant iron is encountered with foundry operations increasing. Specifications against contracts are active. A little more new buying is noted. The Chrysler strike is adversely affecting some foundries but continued high demand from other auto builders is an offset. Requirements from the building field are expanding. Railroads also are ordering castings more actively.

Philadelphia—Pig iron specifications are more active. There are few labor disturbances at the moment and melting requirements are heavier. Eastern Pennsylvania iron foundries believe casting demand this month will be the heaviest this year. The Alan Wood Steel Co. has placed its smaller furnace, down since early last summer, into full prdouction.

Cincinnati—Pig iron requirements are being met by current shipments from northern and southern furnaces. Jobbing foundries are on light melt.

Birmingham — Merchant furnaces, although operating at capacity, are running considerably behind current and prospective needs.

Seattle—Increased buying of good quality European pig iron is noted. It is delivered monthly from Rotterdam at $47.30 a gross ton, approximately $7 less than the delivered price of Geneva iron. No India pig is being offered here.

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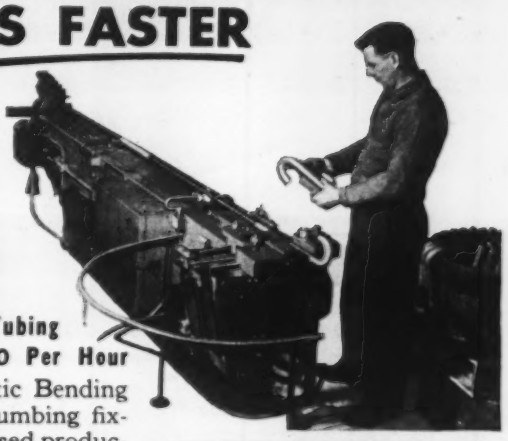

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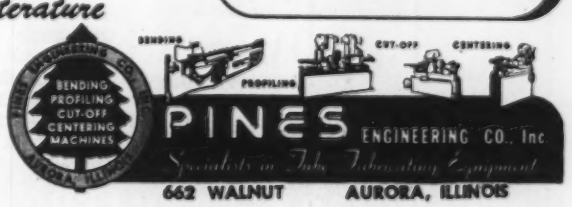

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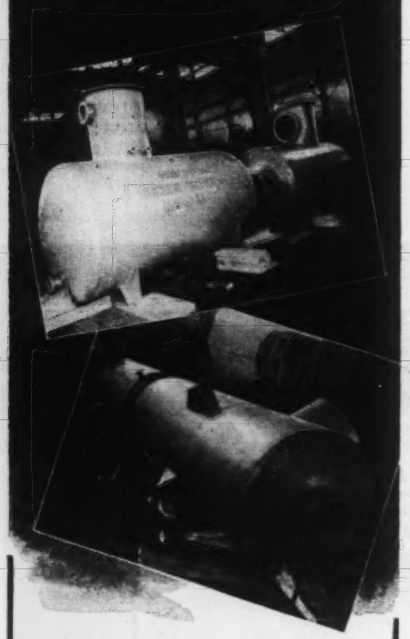

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Titanium Alloy Prices Revised

New York—Titanium Alloy Mfg. Division, National Lead Co. posts new price schedule, effective as of Apr. 1, on following titanium alloys. No change is made in the price schedules of other TAM alloys. The new prices are:

	Per Ton of Alloy ——Dollars——			Per lb of Alloy ——Cents——	
	Carload Min. 56,000 lb	Truckload 23,000-56,000 lb	2000 to 23,000 lb	300 to 1999 lb	Less than 300 lb
High Carbon FCT					
Contract	167	172	177	9.60	10.10
Spot	172	177	182	9.85	10.35
Medium Carbon FCT					
Contract	183	188	193	10.40	10.90
Spot	188	193	198	10.65	11.15
Carbortam (Contract)					
Lump	190	195	200	10.75	11.25
—80 Mesh	390	395	400	20.75	21.25
Carbortam (Spot)					
Lump	195	200	205	11.00	11.50
—80 Mesh	395	400	405	21.00	21.50
	——Cents Per Lb of Alloy——				
Iron Foundry FT					
Lump	30.00	30.00	30.00	35.00	35.00
—80 Mesh	35.00	35.00	35.00	40.00	40.00
	——Per Lb of Ti Contained——				
Steel Foundry FT					
Lump	90c	95c	$1.00	$1.05	$1.10
—80 Mesh	(Quantity prices for lump plus 5 cents per lb of alloy for milling)				
Silicon Titanium					
Lump	$1.00	$1.05	$1.10	$1.15	$1.20
—80 Mesh	(Quantity prices for lump plus 5 cents per lb of alloy for milling)				

The above alloys are sold f.o.b. Suspension Bridge (Niagara Falls), N. Y. Railroad freight or lowest protected motor carrier rate if less, is allowed, regardless of quantity in the United States east of the Mississippi river and north of metropolitan Baltimore. Lowest protected carrier rate to St. Louis is allowed on shipments to points outside the northeastern area described.

Iron Ore . . .

Iron Ore Prices, Page 161

Cleveland—With ice conditions in the upper lakes bad it appears unlikely lake ore shipping will begin much before mid-April. Hopes are high for inter-lake movement of vessels by Apr. 10 and fitting out work is being pressed on the ore fleet. Ore shippers are hoping for an 80 million ton movement this year, though possible dropping out of several vessels from the fleet may make this objective a tough one to attain.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 160

Cleveland—Demand for oven foundry coke is gaining. Jobbing foundries are more active. Machinery and machine tool castings demand is noticeably improved. Coke prices are holding. Speculation as to the strength of the recent advance in coal prices is encountered here. Expectations are prices will ease should the coal market become glutted shortly. Ford Motor Co., it is understood, has not yet lined up coke suppliers for its huge foundry being built here. Up to 800 tons daily will be required by this plant, which will be ready in October, 1951. Some trade authorities see the possibility of Ford putting in a coke plant here in event adequate supplies cannot be lined up in the open market.

New York—The leading local producer of oven foundry coke has not yet revised its price but the Swedeland, Pa., producer has increased its quotation 80 cents to $21.20 ovens. The latter has also increased prices on industrial coke 40 cents to $17.60 ovens. These prices became effective Mar. 27.

Boston—Foundry coke has advanced 70 cents per ton to $23.40 delivered within the freight range of $4.15 per ton.

Pittsburgh—Neville Island oven foundry coke price advanced $1 per ton Apr. 1 to $21. Heavy demand is reported for oven foundry coke. Consumers' coke stocks are gradually returning to normal.

Ferroalloys . . .

Ferroalloy Prices, Page 161

New York—Prices on high-columbium content ore are reported all over the map. In fact, under present conditions it is impossible to determine the exact level of the market. There has been a sharp increase on this ore the past six months. The rise has been far greater than indicated in ferroalloy prices. Trade authorities claim there are too many factors to be considered in present circumstances to make possible the naming of a representative ore price.

Warehouse . . .

Warehouse Prices, Page 161

Pittsburgh—March shipments improved a little from February volume. Demand from the coal mines has not yet regained normal levels. Distributors' stocks are ample for consumers' current requirements although sheets, strip and wide flange beams continue scarce.

Cleveland—Local distributors report heavier demand was experienced throughout March. They expect further gains as the weather improves, opening up building activity. Flat-rolled steel is in tightest supply with tonnage moving from warehouse almost as quickly as it is received from the mills.

Cincinnati—Distributors' sales are well maintained. Tonnage in replacement of stocks is showing post-coal strike expansion. Buying for the coal mines is active.

Philadelphia—Warehouses experienced improved business in March and some believe the trend will continue upward through April.

Chicago—Warehouse shipments are limited by the amount of material received by the distributors. Stocks are depleted on all sheet gages. Supplies of specialties, including tubing, now are down to reasonable levels.

Birmingham—Warehouse business is especially active. Some items, especially sheets, are short. Plates are in better supply. The situation generally is not satisfactory so far as availability of most items is concerned.

Los Angeles—Warehouse activity is improving. Most distributors report volume substantially ahead of that in 1949. Sheets are scarce but stocks of plates, bars and structurals are adequate.

San Francisco—Distributors report heavy demand for sheets. Supply is scarce. Stocks of most other major items are fairly ample.

Seattle—Distributors report a buying upturn, March being the best of the last four months.

Scrap . . .

Scrap Prices, Page 164

Pittsburgh—Unusually heavy demand for turnings to increase blast furnace hot metal yields has forced an advance of $1 in short shoveling scrap to $26 per ton. Crushers are paying 50 cents a ton more for machine shop turnings and mixed borings. Purchases of No. 2 bundles also are noted at a 50-cent price advance. Despite the bright outlook for second quarter ingot production with a consequent pressure for higher open-hearth scrap quotations, mills are experiencing little difficulty in obtaining commitments for Nos. 1 and 2 heavy melting dealer scrap at $32 and $29, respectively. There has been relatively little activity in dealer scrap transactions, despite return to full mill production schedules. Cast market continues inactive and new developments are lacking among railroad items; new lists close this week.

Philadelphia—Scrap prices continue buoyant, affecting most major grades of steel and cast iron. Consumers of heavy melting steel now pay as high as $25.50 on No. 1 grade and $23.50 on No. 2. Low phos turnings and plate scrap, electric furnace grades, are higher at $29-$30, delivered; low phos plate scrap, five ft and under, $29. Heavy turnings are higher at $25-$25.50.

New York—Scrap brokers are offering unchanged prices for the principal open-hearth grades, but are bidding higher for machine shop turnings and mixed borings and turnings at $12-$12.50 f.o.b. shipping point, and for short shovel turnings at $13.50-$14. They also are paying higher for low phos punchings and plate scrap, electric furnace grade, and for low phos plate scrap, five foot and under, at $23.50-$24.

Buffalo—Cast scrap advanced an additional $1 a ton on new orders. Business is reported in cupola at $32.50-$33. Firmer tendencies are noted in steelmaking grades.

Detroit—Reflecting the stepped-up tempo of steel buying through the revived ingot conversion arrangement, the market is strong. Prices of all open-hearth grades, except No. 2 bundles, are up sharply. Practically all the auto companies are buying conversion steel, even strike-bound Chrysler Corp. Some of the smaller companies, such as miscellaneous stamping plants, also are contracting for this premium steel. The conversion picture is more critical than at any time in the past 18 months. Since the practice is based on scrap, the effect is to touch off prices and where they will stop no one knows. The situation is made all the worse by the 75,000-ton monthly shortage in this area caused by the idling of Chrysler plants. In foundry grades, clean auto cast is particularly active.

Chicago—Substantial movement of scrap to foundries, as well as mills, makes broker-dealer activity constant. Price structure is having its wrinkles ironed out. Quiet deals have strengthened the market for blast furnace grades and cast items are generally higher. Railroad material prices are wide open with malleable in especially strong demand. Purchases of angle bars have been made at $39. No. 1 bundles are quoted at $28, unchanged from the corrected price for the previous week.

Cleveland—Scrap prices have advanced $1 a ton on practically all grades with the exception of cast iron and railroad items. While local mills are not making new commitments, a considerable tonnage is moving from this district to Valley mills. Only a small part of this business is on a conversion basis.

Cincinnati — Fresh buying which may lift prices is expected in the scrap market. Undertone is strong despite unchanged prices, because of good bids on railroad lists.

Birmingham—Scrap demand is considerably more active than a few weeks ago, but buying is comparatively moderate and stocks are rising.

St. Louis—Brokers' offering prices rose 50 cents to $2 last week under renewed buying by mills and foundries. Railroad items were up $1 to $2. Rail scrap offerings lately have been notably small. Re-entry into the market of American Steel Foundries, long shut down, put upward pressure on prices.

Los Angeles—Uncertainty rules in scrap with the price trend indefinite. Decreased demand brought a $4 drop in machine shop turnings to $5 per gross ton, but stronger undertone is noted in cupola cast, a large tonnage bringing an increase of $1 per ton.

Seattle—Scrap is in ample supply. Prices of No. 1 and No. 2 heavy melting remain steady at $18.

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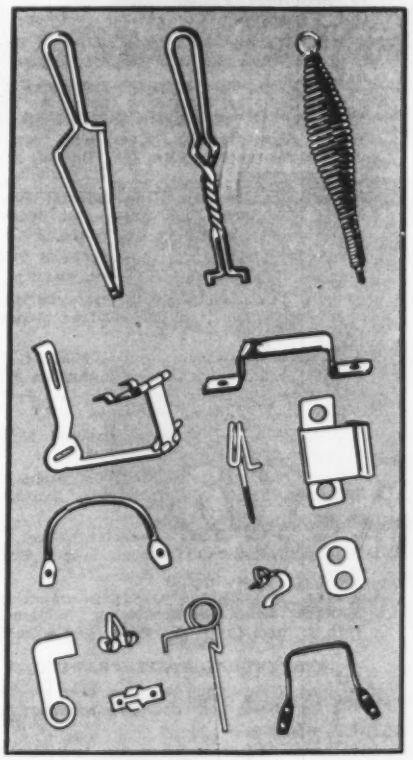

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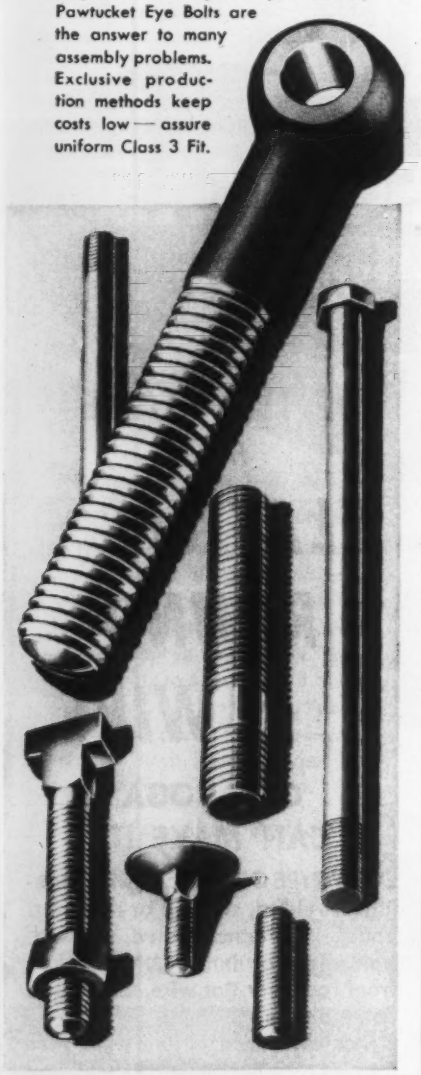

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Canada . . .

Toronto, Ont.—Primary iron and steel shapes produced in Canada in December totaled 305,636 net tons against 316,219 tons in November and 300,585 tons in December, 1948. Shipments for sale in December amounted to 234,284 net tons compared with 239,797 tons in November and 212,886 tons in December, 1948.

Of shipments for sale last December, 6997 tons were semifinished shapes, 11,718 tons of structurals, 12,220 tons of plates, 30,979 tons of rails, 6180 tons of tie plates and track material, 45,593 tons of hot-rolled bars, 16,964 tons of pipe and tubes, 25,194 tons of wire rods, 21,808 tons of black sheets, 7272 tons of galvanized sheets, 6778 tons of castings, and 13,083 tons of other rolled products.

For the full year 1949, production of primary iron and steel shapes totaled 3,666,242 net tons.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3500 tons, state turnpike bridge, Beaver county, Pennsylvania, to American Bridge Co., Pittsburgh.

1750 tons, state bridges, Waltham-Weston, Mass., to West End Iron Works, Cambridge, Mass., through J. F. Fitzgerald Construction Co., Boston.

1550 tons, Washington state Longview bridge, to Bethlehem Pacific Coast Steel Corp.; Guy F. Atkinson Co. general contractor.

900 tons, Warick apartments, Atlantic City, N. J., to Belmont Iron Works, Eddystone, Pa.

800 tons, office building, New Hampshire Fire Insurance Co., Manchester, N. H., to O. A. Wilson Structural Co., Cambridge, Mass., through George A. Fuller Co., Boston, general contractor.

600 tons, state bridge, Carbon county, Pennsylvania, through Pine Brook Iron Works, to Anthracite Bridge Co., Scranton, Pa.

300 tons, two bridges for Alaska Road Commission, to Isaacson Iron Works, Seattle.

250 tons, Newberry Company store building, Spokane, Wash., to Union Iron Works, Spokane.

200 tons, state bridges, Sutton-Northbridge-Douglas-Uxbridge, Mass., to Bethlehem Steel Co., through S & M Construction Co., Providence, R. I., general contractor.

135 tons, telephone building, Ridgewood, N. Y., to Grand Iron Works Inc., New York.

125 tons, reconstruction Bonneville bridge, to Willamette Iron & Steel Corp., Portland, Oreg.

100 tons, state bridge, Berkeley, Mass., to Bethlehem Steel Co. through Dwyer Bros., Newport, R. I., general contractor.

Unstated, two 350-ton traveling cranes for McNary dam, powerhouse, to Willamette Iron & Steel Corp., Portland, low $300,556.

STRUCTURAL STEEL PENDING

2900 tons, New Jersey turnpike, contracts 3-A and 3B, Salem and Gloucester counties; bids Apr. 11.

2750 tons, New Jersey turnpike, contract 15, Union county; bids Apr. 4.

2700 tons, veterans hospital, Cincinnati; John A. Johnson, New York, low on general contract.

2050 tons, New Jersey turnpike, contract 30, Raritan river; bids Apr. 18.

1800 tons, New Jersey turnpike, contract 21, Mercer and Middlesex counties; bids Apr. 18.

1400 tons, Washington state Snake river bridge; general contract to General Construction Co., Seattle, low $1,244,545.

1000 tons, research laboratory, United States Atomic Energy Commission, Oak Ridge, Tenn.; bids May 4.

650 tons, textile mill, Dulan Corp., North Carolina; bids asked.

560 tons, five state bridges, Uxbridge, Mass.

500 tons, machine shop, Atlantic Refining Co., Philadelphia; bids asked.

350 tons, state bridge, Plymouth, Mass.; bids Apr. 4, Boston.

300 tons, two Washington state bridges, Grays Harbor county, general contract to Sealand Construction Co., Seattle, low $235,748.

290 tons, Maryland state bridge, Queen Ann county; Sheets Contracting Co., Baltimore, low on general contract.

150 tons, Murphy Dome military installation, Alaska; Morrison-Knudson Co. and Peter Kiewit Construction Co., joint low bid $3,113,113.

150 tons, Fire Island military installation, Alaska; J. A. Pomeroy Co., San Francisco, low $2,685,196.

100 tons, Bonneville Power Administration, Olympia, Wash. power station; bids to Portland, Oreg., Apr. 11.

100 tons, state bridge work, Cambria county, Pennsylvania; bids Apr. 21.

Unstated tonnage, private hospital, Hagerstown, Md.; bids Apr. 25.

Unstated, crane runway and miscellaneous items, Hungry Horse power plant; bids to Bureau of Reclamation, Denver, Apr. 11; Schedule No. 2956.

Unstated, 140-ton and 30-ton gantry cranes for McNary dam power plant; bids to U. S. Engineer, Walla Walla, Wash., May 10.

Unstated, 14th Avenue So. King county bridge; E. E. Settergren, Seattle, low $85,260.

REINFORCING BARS . . .

REINFORCING BARS PLACED

380 tons, Franklin apartments, Juneau, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle.

300 tons, miscellaneous small contracts to Bethlehem Pacific Coast Steel Corp., Seattle.

250 tons, approaches to Washington state Longview bridge, to Bethlehem Pacific Coast Steel Corp., Seattle; Guy F. Atkinson Co., general contractor.

100 tons, Norway Center club house, Seattle, to Pacific Coast Steel Corp., Seattle; Olav Boen, Seattle, general contractor.

REINFORCING BARS PENDING

425 tons, Washington state Snake river bridge; General Construction Co., Seattle, low.

260 tons, state highway, Lexington, Mass.; Henry N. Worthington, Quincy, Mass., general contractor.

100 tons, Washington state highway bridges, Grays Harbor county; Sealand Construction Co., Seattle, low.

100 tons, Washington state slab bridge, Mason county; Northwest Construction Co., Seattle, low $288,327.

Unstated, 4-unit fruit storage plant, Cashmere, Wash.; Mowat Construction Co., Seattle, low $375,222.

Unstated, 105 x 216 foot concrete warehouse for Port of Anacortes, Wash.; bids Apr. 6.

Unstated, science and laboratory buildings, University of Oregon; Ross B. Hammond, Portland, Oreg., general contractor, low $669,629.

Unstated, $500,000 city stadium; bids to Spokane, Wash., April 6.

Unstated, $900,000 plant for Republic Publishing Co., Yakima, Wash.; general contract to Howard S. Wright Co., Seattle.

PLATES . . .

PLATES PLACED

2200 tons, unstated government installation, to Chicago Bridge & Iron Co., Seattle.

1000 tons, eleven storage tanks for Standard Oil Co. of California, Pasco, Wash., to Chicago Bridge & Iron Co., Seattle.

500 tons, six storage tanks, Standard Oil Co. of California, near Pendleton, Oreg., to Chicago Bridge & Iron Co., Seattle.

240 tons, tank work, Public Service Gas &

Electric Co., Newark, N. J., to an unnamed fabricator.

100 tons, three tanks, Public Service Gas & Electric Co., Newark, N. J., to Bethlehem Steel Co.

100 tons, piling for Washington state Metaline Falls bridge, to Columbia Steel Co., San Francisco.

PLATES PENDING

4500 tons, 2000 lineal ft cofferdam, sheet steel piling, Chief Joseph dam; bids to U. S. Engineer, Seattle, May 2.

1000 tons, twelve plate-lined concrete storage tanks; bids to General Electric Co., Richland, Wash., May 9.

PIPE . . .

CAST IRON PIPE PLACED

150 tons, 4 in. cast iron pipe, district No. 61, Seattle, to H. G. Purcell, Seattle, for U. S. Pipe & Foundry Co., Burlington, N. J.

STEEL PIPE PENDING

Unstated, 1700 feet, 10 gage, 10 in. steel pipe for system improvement; bids to Leavenworth, Wash., Apr. 1.

RAILS, CARS . . .

RAILROAD CARS PLACED

Lehigh Valley, 1500 fifty-ton box cars, 1000 going to Bethlehem Steel Co. and remainder to unnamed builder.

Minneapolis, St. Paul & Sault Ste. Marie, 75 seventy-ton covered hopper cars, to the American Car & Foundry Co., New York.

Spokane International, 23 seventy-ton covered hopper cars, to American Car & Foundry Co., New York.

LOCOMOTIVES PLACED

Erie, 62 diesel locomotives: Two 6000 hp road freight units and fourteen 1500 hp switchers to American Locomotive Co., New York; twenty-six 1500 hp road switchers and five 1000 hp yard switchers to Electro-Motive Division, General Motors Corp., LaGrange, Ill.; nine 1500 hp road switchers to Baldwin Locomotive Works, Eddystone, Pa.; six 1000 hp switchers to Lima-Hamilton Corp., Lima, O.

LOCOMOTIVES PENDING

Chesapeake & Ohio, 21 diesel-electric locomotives, pending; list comprises sixteen 1500-horsepower road units and five 1200-horsepower switching engines; they will be operated on the Canadian Division.

FERROALLOYS

(Continued from Page 161)

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., SMxD, bulk, 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lots 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 20.50c per lb of contained chromium plus 11.30c per pound of contained silicon; 1" x down, bulk, 20.65c per pound of contained chromium plus 11.50c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max 0.50%

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KRANE KAR is a lively swing-boom mobile crane, gas or diesel operated, of compact dimensions, short turning radius. It transports any load it can lift. Put it to work in any part of your plant, yard, or stores; it will speed up production, cut down handling costs. Available for service 24 hours a day, every day.

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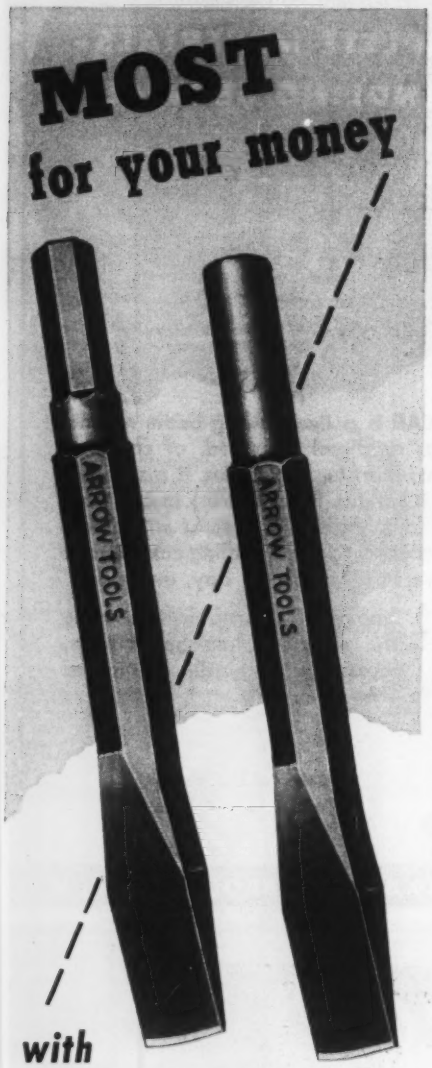

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C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

Silicon Alloys

25-30% Ferrosilicon: Contract, carload, lump, bulk, 17.00c per lb of contained Si; packed 18.40c; ton lot 19.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk, 14.65-15.0c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe). C.l. lump, bulk, regular 19.0c per lb of Si, c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 7.65c per lb of alloy, ton lots packed 9.05c, 200 to 1999 lb 9.40c, smaller lots 9.90c. Delivered. Spot up 0.5c.

Briquetted Alloys

Chromium Briquets: (Weighing approx. 3⅜ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.05c, less ton 12.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.30c, per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c. (Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size ony. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

Calcium Alloys

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%.) Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot add 0.25c.

Titanium Alloys

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lots 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.) Ton lot $1.28, less ton $1.35, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $160 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 3-4.5%.) Contract, $175 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

Vanadium Alloys

Ferrovanadium: Open-Hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max.) Contract, any quantity, $2.90 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.) $3.10.

Grainal: Vanadium Grainal No. 1, 93c; No. 6 63c; No. 79, 45c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.20 per lb contained V_2O_5, freight allowed. Spot, add 5c.

Tungsten Alloys

Ferrotungsten: (70-80%). Contract, 10,000 lb W or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

Zirconium Alloys

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract carload, lump, packed 20.25c per lb of alloy ton lot 21c, less ton 22.25c. Freight alowed. Spot, add 0.25c.

Boron Alloys

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered. Spot, add 5c F.o.b. Washintgon, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $4.25 per lb contained B, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots,. 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

Other Ferroalloys

Ferrocolumbium: (Cb 50-60%, Si 8% max., C 0.4% max.). Contract, ton lot, 2" x D, $3.50 per lb of contained Cb, less ton $3.55. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min. C 0.30 max.) ton lots, 2" x D, $2.67 per lb of contained Cb plus Ta, delivered; less ton lots $2.72.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 16.5c per lb of alloy, ton lots 17.50c, less ton 18.5c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.00c per lb of alloy; ton lots 18.00c; less ton lots 19.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 14.25c per lb of alloy; ton lots 15.75c; less ton lots 17.00c, f.o.b., Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Lump, bulk, carload 11.00c. Ton lots, bulk 11.50c, packed 11.75c. Less ton lots, packed 12.25c per lb of alloy, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. seller's works, Mt. Pleasant, or Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth and Washington, Pa., furnace, any quantity $1.13.

Technical Molybdic-Oxide: Per lb, contained Mo., f.o.b. Langeloth and Washington, Pa., packed in bags containing 20 lb of molybdenum, 95.00c.

New di-acro POWERSHEAR

OFFERS
CONTINUOUS ACTION
plus
VARIABLE SPEED

From 30 to 200 strokes per minute

for high speed

DIE-LESS DUPLICATING

The new Di-Acro POWERSHEAR has remarkable speed and accuracy for the production of small parts and pieces. Consider these points: 1. **CONTINUOUS SHEARING ACTION**—no clutch to engage! Feeding speed determines shearing speed. 2. **VARIABLE SPEED**—cutting cycle quickly set for each shearing operation. 3. **EASE OF OPERATION** — fatigue is reduced, accuracy increases, production soars. 4. **"SINGLE STROKE" SHEARING** — non-repeating safety clutch for jobs not adaptable to continuous shearing.

Any plant doing high speed precision work on smaller parts from any shearable material cannot afford to be without the DI-ACRO POWER-SHEAR. Available in 12" and 24" shearing widths, capacity 16 gauge sheet steel. Also standard model.

See Di-Acro Exhibit Booth 316—Tool Engineers' Industrial Exposition, Philadelphia, Pa., April 10-14.

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Metalworking Briefs

CONSTRUCTION, ENTERPRISE ORGANIZATIONAL CHANGES

Plant Engineers Club of the San Francisco bay region has been organized by E. F. Sullivan, San Francisco Naval Shipyard, Rollin J. Lobaugh, Pacific Screen Products Co., and other leading plant engineers and industrialists in that area. The club aims to provide free interchange of information dealing with ways to lower operating costs and obtain higher efficiencies in noncompetitive phases of industries in the area.

Invitations to bid on the construction of waste disposal facilities at Hanford Works, Richland, Wash., will be available Apr. 6 from **General Electric Co.**, prime contractor.

Durez Plastics & Chemicals Inc., North Tonawanda, N. Y., plans construction of a research laboratory. Harry M. Dent is president.

Ralston Purina Co., 838 S. Eighth St., St. Louis 2, awarded a contract to **Milling Engineers Inc.**, 1911 Baltimore Ave., Kansas City, Mo., for designing and construction of a $1 million feed mill to be erected in Macon, Ga.

Bids closed Mar. 27 on the construction of a reinforced concrete factory addition for the **National Lock Co.**, Rockford, Ill. Gilbert A. Johnson, American Bank Bldg., Rockford, is the architect and engineer in charge of the plans and specifications.

Bonifield Bros. Truck Lines, Metropolis, Ill., awarded the general contract for a truck terminal building to Industrial Construction Inc., 3615 Olive St., St. Louis. Frank L. Thompson, 10408 Manchester Rd., Kirkwood, St. Louis 22, is the architect.

Proctor & Gamble Mfg. Co., Cincinnati, awarded the general contract for a factory building at 169 Grand Ave. to H. K. Ferguson Co., Cleveland.

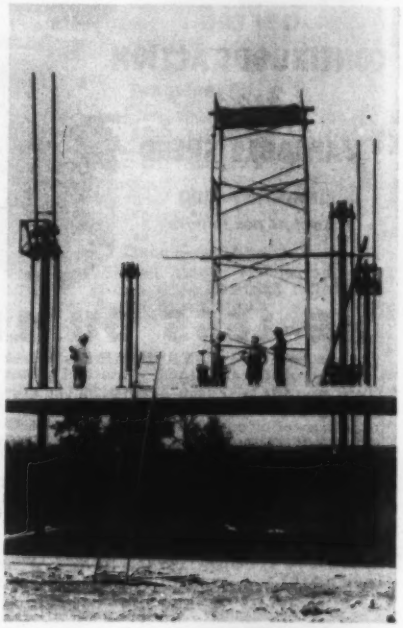
Barrett Division, **Allied Chemical & Dye Corp.**, New York, is constructing a $2 million roofing plant near the company's Wylam, Ala., plant.

General Tire & Rubber Co., Akron, has started work on a $500,000 office and warehouse building in the central manufacturing district of Los Angeles. Buttress & McClellan Inc. is the contractor.

Valve Pilot Corp.—locomotive equipment—Albany, N. Y., was sold to F. N. Bard of the **Barco Mfg. Co.**, Chicago. Manufacturing operations are expected to be moved to Chicago.

Square D Co.—electrical equipment—will build a plant in San Francisco, doubling its facilities in that area. Work will start in about three months and is scheduled to be completed by the end of the year.

Kennedy Valve Mfg. Co., Elmira, N. Y., bought the **Semler Co.**, Jeannette, Pa.



SLICK METHOD: A technique for casting floors and roof slabs with only edge forms and raising them to permanent positions by automatic lifting equipment is this Youtz-Slick method, named for Tom Slick and P. N. Youtz. After a floor is poured, a second floor or roof can be poured on the base slab which is used as a bottom form. The slab is raised to its permanent position with special lifting equipment and welded into place by a collar placed in the slab at the time of pouring

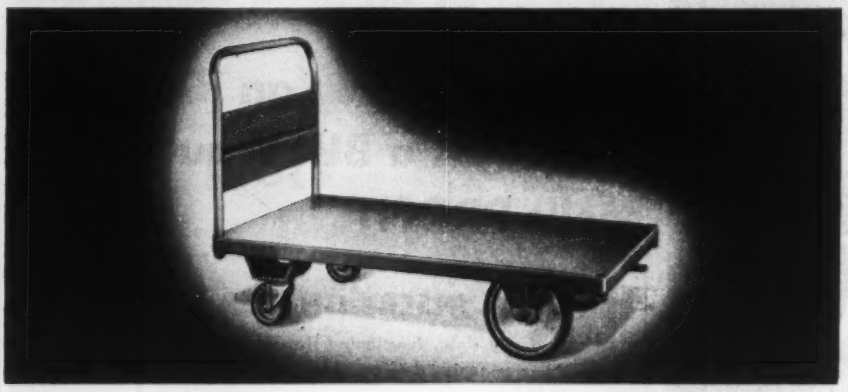
Coffin Redington Co., San Francisco division of **Brunswick Drug Co.**, will start construction July 1 of a $500,000 distributing plant at Sacramento, Calif.

Kaiser Steel Corp. is constructing two new soaking pits at its Fontana mill, bringing the number of pits to 16. This work will complete the $35 million expansion program now under way at Fontana, Calif., designed to raise finished steel production 11 per cent.

Texas Engineering & Mfg. Co., Dallas, contracted to manufacture 200 vending machines for Multiple Products Corp., Dallas. The machines will vend a shaved ice confection.

Thomas Steel Co., Warren, O., reports an appropriation of about $1 million for a high-speed tandem cold reduction mill and auxiliary equipment.

Rice Pump & Machine Co., Milwaukee 15, formerly a division of **Milwaukee Chaplet & Mfg. Co.**, is established as a separate corporation. R. D. Houghton, formerly division manager, is president and treasurer of



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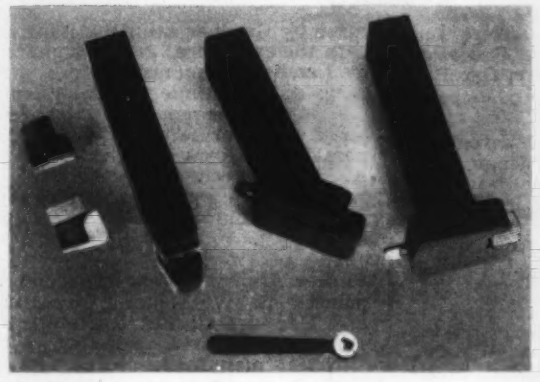

You are invited to inspect these tools, Booth 5, ASTE Industrial Exposition, Phila., Pa., April 10-14-1950.

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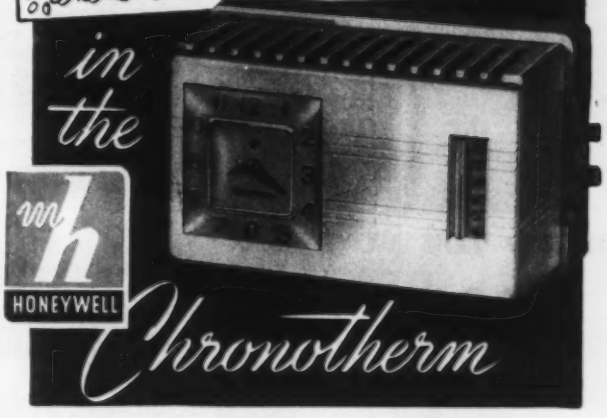

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Chronotherm

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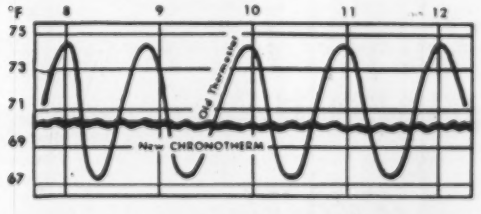

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